The BUILDER

Social Progress in 1866.

FAST-FLYING Time, while bringing its changes, leaves its memories also. As occasion first arises to replace by a new series of figures the familiar date which has lately headed our pages, we are led to glance with somewhat more than usual gravity both at the past and towards the future; to inquire what the outgoing year has left behind in the shape of solid acquirement and material progress, and what reason may be safely assigned for the hope and promise of its successor.

Especially does the season call on those public writers whose object is not the mere perfunctory production of a certain number of columns of letterpress, but who have the higher aim of doing service to their contemporaries and to their country by their consistent advocacy of right principles and the faithful pursuit of truth, to review the field of their exertions, and to see what progress has been effected by their labours. Not that it is often given to any individual workman of this honourable guild to trace the results of his own toil, or to attribute the success of any great principle to the service of his own pen. At all times in human history new veins of thought, whether in theory or in practice, have been contemporaneously reached by independent workers. The priority of a few days may be disputed by the friends of Newton and of Leibnitz, of Le Verrier and of Adams, but the fact of the independent original discovery effected by the owners of these great names admits of no denial. Speke and Grant pushed their explorations in one portion of the great river system that feeds the Nile, while Baker, in another locality, made discoveries as to the cause of the annual flood that shed far more light on the solution of this great geographical problem than did even his heroic persistence till he bathed in the waters of the larger of the two headwater lakes. There is honour enough for each patient investigator,—honour that is in no way diminished by being shared. Thus if we see that the principles of politics, viewed as a science, in contradistinction to the maxims of politics viewed as a trade, or politics followed as a hobby, are becoming more and more appreciated by the intelligence of the day, we are ready to congratulate our brother writers, and to congratulate our fellow-countrymen, without yielding to the weak selfishness that is always crying out, "You have stolen my thunder," or "You have taken the path which I was the first to point out."

In the practical comprehension of many of the principles that underlie a healthy social life, the very building principles of society, we think that a marked progress has been made in 1866. Distinct from the subjects of building as a craft, of architecture and of engineering as sciences, of pictorial and plastic art as methods of adornment and as means of education, are those questions in the treatment of which the engineer or the architect has to deal with politics, strictly so called, that is to say, with the cardinal points on which the welfare of the community hinges. Such is the true political spirit which distinguishes the founder of a city from the constructor of a row of houses,—the man who would build his fame from the man who seeks only to fill his pocket. The sanitary state of towns, involving the important questions of drainage, of water-supply, of ventilation, of consumption of smoke, —the provision of homes for the poor, and of hospitals for the sick,—the communications of town and of country, internal and external, including roads, footways, railways, telegraphs, docks and harbours, locomotive and water-going steam engines,—the supply of food, and the improvement of agriculture,—the supply of clothing, and the progress of manufactures,—the defence of the great centres of national life, involving questions of arms and of fortifications, of monster guns and of iron-clad steamers,—and the direction of the intelligence and the industry of the country in those channels which alone lead to a sound and permanent prosperity;—these are the main divisions of that practical political science which ranks among its disciples all men of earnest thought, from the statesman who moulds petty communities into great states, to the practical mechanic who discovers that chilled iron will advantageously replace the costlier material of steel.

In some of the subjects which we have thus cursorily indicated we think that the year 1866 has witnessed an appreciable progress; the public mind is far more fully awake than at any former time to the importance of sanitary questions. We will not refer to the numerous disabled pumps that disfigure the metropolis in support of this assertion, though even here both scientific labour and social courage have been needed in dealing with a convenient and popular source of danger. But generally speaking, the vital importance of a pure water-supply has been constantly kept before the public. A knowledge has been attained on the subject which must, to some extent, influence all future legislation. Reports on the sanitary state of certain districts, reports on the purity of water, reference of the mortality of cholera to a great predisposing cause,—impure sources of service,—have not only filled the public journals and occupied the public mind, but we are beginning to see the benefit of the attention already given to the subject in the stately walls that bid fair to girdle the Thames, in the re-appearance of fish in its waters, and in the fact that the mortality from cholera during its presence in London in 1866 was at the rate of 8 in the 10,000 in place of the 120 in the 10,000 that fell before the visitation in the year 1849.

In the vital question of national defence, we have the satisfaction of feeling that, in the event of war, our troops will not be matched against an enemy possessing a weapon so confessedly superior to their own as to convert a fight into a *battue* at their expense, as was the case with the brave Danes at Düppel and with the imperial troops at Sadowa. But the satisfaction due to our tardy adoption of a breech-loading rifle is alloyed by the remembrance of the melancholy death of the inventor, whose plan we adopted, a death hastened, or altogether caused, not, we candidly believe, by human malice, but certainly by the malignity of red tape. We trust that among the millions whose sleep will be all the safer, if not all the sounder, for the eight years' toil of Mr. Snider, will be found some to inquire what tardy reparation may yet be offered to his representatives. For larger arms, as well as for the vessels that are to carry them afloat, we can only say that experiment and discussion have been actively, if not very systematically or successfully, pursued; and that if no one should attack us till we have made up our minds on the subject, and then carried out the result of our deliberations, we shall probably be in a very imposing position of defence when that time arrives. The greatest boon of the year in this respect is the application of the process of chilling to iron shot and shell, and the advantage thus secured to offensive operations. We have learned, too, at some cost, in the instance of the *Northumberland*, how *not* to lay the ways for launching an armoured vessel.

The absence from our Cabinet of that important officer, a Minister for Public Works, has led during the past two years to the application of the cumbrous and expensive expedient of a Royal Commission in three several instances. The Railway Commission and the Coal Commission have as yet given no utterance as to their labours; the River Commission, as our readers are aware, have added to their hurried

report,—hurried, as we have reason to believe, not by their own fault,—much valuable information, to which we have more than once taken occasion to refer. It is to be hoped that the instructions to the Railway Commission are such as to allow the commissioners to deal, so far as recommendation of legislative or administrative measures goes, with such gross cases of railway swindling as have shaken the public confidence, and impaired the national credit, within the past year. The press has shown no hesitation in publishing facts which need no comment, and which of themselves form an unqualified condemnation of their perpetrators, however high the names of these persons may have previously stood. But it is only very recently that there has appeared in any portion of the public press any active support of the opinion, which we felt it our duty in the first instance to express, that illegal acts for the purpose of raising money should not only be called by their right names, but should be visited with their appropriate penalty. The unexampled chronic panic which has reigned since the month of May seems not unlikely to continue, so long as financiers who execute on a large scale operations of a nature smaller attempts at which are visited by the treadmill, may be "unfortunate" with impunity. The wise and liberal legislation of which the tendency is to render debt a point of honour, and to refuse to allow the officers of the law to aid the reckless and improvident creditor, will fail in its object, or will do more harm than good, unless it be accompanied by increased stringency in all cases of actual fraud. If a bankrupt business is to be bought and sold for a premium of half a million sterling; if debentures are to be issued contrary to legal provision; if in any instance one of the harpies who make many poor in order to make one or two very rich is detected in passing the strictest limit of legality, the atonement due to wronged society should be exacted; nor should it be left to individual sufferers to set in motion the sharp machinery of the criminal law in a case of swindling any more than in a case of violence.

A suggestion has come before the public, rather as the convenient discovery of a political secret than as a positive proposal, to supplement the best managed of English institutions, the Post Office, by the committal of electro-telegraphy to the same able and successful management. English habit and English prejudice are, or rather were, very strongly opposed to the interference of Government in matters that have been of late years handed over altogether to private enterprise. But the conspicuous failures of private enterprise, the waste and loss incurred in the construction and management of railways, the disregard of public convenience which railway boards display, the want of provision for obvious need, or of mutual arrangement where both public and proprietary are the sufferers, as in the ill-considered tangle of conflicting railways that obstruct one another at London Bridge, the collapse of limited companies, stand in such strong contrast with the cheap, punctual, profitable working of the Post Office, that a change in public opinion is far from improbable. If a Government official do wrong, there is, at all events, some responsible person to attack, some one who cannot dive for shelter beneath the green cloth of a "board," and in all cases where regularity of administration is the main requisite, we think it probable that the most regular and capable administrators will be those chosen by the Government of the country. To the report of the Railway Commission, we shall look for much valuable information on this head. The enforcement of a uniform, intelligible system of accounts, showing to the plain sense of men of moderate skill in calculation the two great facts of the worth and cost of their property, and of the gross and net amount of their income, with stringent and easily recoverable penalties against those who should withhold or "cook" such half-yearly accounts, is another point which recent great scandals and misfortunes should induce the public loudly to demand.

That peculiar feature of the national character which renders Englishmen in the mass so patiently submissive to unnecessary and avoidable inconvenience, provided that it arises from want of forethought, arrangement, or organization, still marks many of the habits of London. No provision has yet been made for the accommodation of the immense and overgrown street traffic, increasing at the rate of 3¾ per cent. per annum, and driven into fresh eddies by the opening of each additional railway station. The stream of passengers from east to west that converges at St. Paul's and at the Mansion House is yet forced through the narrow channel of Cheapside. The powers that rejoice in covering the carriageways at inconvenient seasons with 4-in. cubes of broken granite have successfully resisted the attempt to introduce the steam-roller, although the macadamisers of Hyde Park have amused themselves with the solemn promenade of a horse-roller, somewhat more efficient than a child's perambulator.

The scavenging of the streets in muddy weather is still committed to volunteers, who levy a black mail at every crossing, at a cost of time and of labour ample to effect the decent and efficient cleansing of the thoroughfares. Our main highways are still, as of old, obstructed from time to time by the sudden appearance of men armed with planks and barrows, who proceed to pull up the pavement, or to pull down the houses, or to sink mines and tunnels beneath the carriage-way, with as imperturbable a serenity as if the thoroughfare of a crowded city was the natural scene of action for the "navvy." Still, as of old, gang succeeds gang; and no sooner is the road relaid over the sub-railway than it is taken up again for the water-works; no sooner is it replaced by the water-works than it is afresh invaded by the gas folk. Still do English architects persist in building houses without chimneys,—that is to say, without chimneys that will free the apartments from smoke; and the habitation of any new building is announced by the outbreak on the roof of those curious, varied, and unmechanical cowls, tubes, and wriggling spouts in which the smoke doctor and the chimney quack delight. Still do we persist in sending a large per-centage of our costly coal through these wonderful structures, to pollute the air we breathe, and in getting rid by the same means of the greater part of the heat produced by the consumption of the remainder. Last, we are submitting to the greatest injury that can be inflicted on the atmosphere of London by failing to preserve Hampstead Heath, which is now invaded by the builders, and thus about to poison, with the products of animal, vegetable, and mineral combustion, the one pure fresh wind that sweeps through the streets of London.

In addition to the large increase in our power of national defence which we owe to Mr. Snider and to Major Palliser, the chief features of our national advance in 1866 are the union of the Old and the New World by the Atlantic cable, and the opening of a sure and providentially arranged system of railway accommodation for a portion of the suburban traffic of the metropolis by the completion of the Victoria Bridge. The patient courage, the devotion of time, of science, and of capital that have achieved the great work of telegraphic union, and the yet more surprising feat of the recovery of the lost cable from the bed of the Atlantic, have been gracefully acknowledged by the Queen, and are receiving an ample and well-earned meed of pecuniary recompense. The public have not, in this instance, been the sole gainers by the enterprise of the Company; and many who would never have contributed even a word of encouragement during the hard times of the undertaking may now grumble that the convenience of the submarine wires is not more appropriated to the amusement of the readers of daily newspapers than to the commercial service of the Company and their customers. In this, as in other cases, we hold that the true rule is the establishment of such rates of charge as will best remunerate the proprietors of the telegraph. We should think that rates considerably lower than those now charged would ultimately follow from the application of this rule, but that is a point on which the first half-yearly reports will furnish better materials for judgment. At all events, the Atlantic telegraph is not likely to fall into the condition of that which transmits from Bombay messages so utterly unintelligible that the persons who are expecting the information they ought to convey are unable to decipher their meaning. The very recent date at which the great Victoria Bridge has been opened enables us to do little more than chronicle the fact that the science and experience of one of the few remaining lieutenants of Robert Stephenson has been wisely appealed to by the directors of the three lines the enormous traffic of which converges on this important point, to an extent that will require the passage of nine hundred trains daily over the Thames. The care which has been given to attain the result on which we have so often insisted as indispensable, the perfect independence of the routes for the several streams of traffic, so that the swift through trains shall not have their progress throttled by the risk of collision with the frequent short local service, has yet to be appreciated by the public; but it is clear that the servants of the company have in this instance,—and in this instance, with one exception, that of the Metropolitan Railway, alone—a fair chance of a punctual and satisfactory discharge of their duties. When the absolute block that followed the opening of the Cannon-street Station, a block which twelve months previously we predicted in these pages, and the present imperfect service from the Charing-Cross Station, which entirely prevents the company from carrying the enormous traffic, which the employment of due provision, such as that designed by Sir Charles Fox, would have secured, come to be contrasted with the service that is now practicable at the Victoria Station, the public will feel the force of the arguments we have urged, and will insist that time shall be no longer scandalously wasted, nor human life recklessly endangered, because railway companies run across their own lines in the way in which the Legislature has prohibited them from crossing the less important and less frequented routes of the country highways.

A feature not less important than hopeful marks the closing month of 1866. The voice of common sense, and of that wise charity that begins at home, has begun to make itself heard above the false rant. The working men of Staveley have heard the voice of the delegates of the strikemongers in the very words which we ventured to put into the mouths of these evil missionaries. The fact that the iron producers of Belgium are so well prepared to run a dead heat with those of England that the latter can no longer afford to carry the dead weight applied by bad regulations of trades unions or of political unions is becoming daily more clear to those most deeply interested in its existence. The strong mother-sense of the straightforward English workman has been appealed to, and the appeal has been answered by the workman himself, in all the nervous unlettered eloquence of Bunyan,—"I have a union of my own at home, a wife and six little ones, and that is the union I mean to stick to." Let this spirit, and this intelligence, awake and spread; let the working men pause before they forsake the anvil, the bench, the loom, for pot-house agitation. Let them determine that every man shall have perfect liberty of action; that no rules to keep all down to one dead level be permitted; that every man be enabled to do his best; and we may fearlessly raise our old cry of "England against all the world," "So England to herself do prove but true."

THE FIRE AT THE CRYSTAL PALACE.

A RUDE practical commentary on a vulgar idea concerning the "ferro-vitreous" method of building, was made on Sunday afternoon last; when the northern end, called the Tropical Department, of the Crystal Palace, was almost entirely destroyed by fire; and invaluable specimens illustrative of some of the chief arts and sciences were buried under heaps of broken ironwork, or consumed and lost. Such a combination of delight for the eye, with educational agencies, there had never been before, at one spot, in or near London; and there is not now in any capital in Europe. Here, rather than in portions of the building appropriated often, as they are at this moment, or in great part, to the less instructive of the items of attraction, was realized something that approached to the original ideal of some of those individuals who were the founders of the Crystal Palace Company, or advisers of the first Board of Direction. The beauty of nature and of art; appliances for education and study; the nucleus of a collegiate institution; books and news: in short, the Academic Grove, the Museum, and the London Club, were there together: there, even in winter, within the walls of glass, was moderate warmth; and in summer was a balcony where the visitor to the reading-room might sit in the open air, with book or paper, or enjoying one of the finest prospects in England. London had no public reading-room so comfortable or so bountifully provided; and one of the recommendations of the room, as well as of its adjuncts, the lectures and classes, consisted in the fact that the advantages could be had by ladies. The temporary deprivation, and in many respects total loss, as regards the Tropical Department of the

Crystal Palace, is therefore of serious importance to families resident in the vast suburb that has grown about the Crystal Palace, and which extends now from London to Croydon. The destruction of the building would have had an important effect on the value of land and houses in the neighbourhood; and the entire destruction would certainly have taken place, had the wind, instead of being from the west or south-west, been in an opposite direction. Architects have to regret the partial destruction of the Alhambra Courts, to which Mr. Owen Jones gave so much assiduous care, after years of study of the original models,—and which if they became the most popular of the Fine Arts Courts, had been the most costly in their wall-decoration; and they will regret the greater havoc that the fire has made in the Byzantine Court (one of Mr. M. D. Wyatt's reproductions), and the total destruction of the Assyrian Court,—the embodiment of Mr. Fergusson's theories,—of the collections of models of building-contrivances, engineering works, and ships, and of the Indian and Chinese collections. The great seated figures copied from the temple at Aboo Simbel are greatly disfigured, or in part destroyed; and the avenue of lions *couchant* is gone, along with the greater portion of the marble-margined fish-canal. The northern one of the two bronze fountains by Monti is represented by a shapeless mass. One loggia of the cloistered walk, enclosing the Byzantine Court, copied from the Church of St. Mary at Cologne, indeed remains, or on the western side, with its ceiling unharmed, and the painted decoration even, of its exterior, scarcely injured; whilst in the centre itself of the court still stands the fountain of Derbyshire marble produced after that of Heisterbach on the Rhine. But the remaining sculpture in this northern end of the Palace, excepting the southern one of the bronze fountains, is either lost or greatly injured: the valuable copies of the Ægina marbles have wholly disappeared. The recumbent effigies of the Crusaders, in the Byzantine Court, are covered with rubbish; and some of the copies obtained at so much pains from Fontevrault, of the tombs of the Plantagenets, may perhaps need to be again compared with the originals ere they can be restored satisfactorily. The casts of fonts and other works important to the history of British and Irish art lie broken to fragments, and mixed with indescribable rubbish out of which protrude leaves of the files of the *Times* or the *Moniteur*. Even southward of the glass- and canvas-screen, in parts of the building which remained intact,—excepting as to glass-breakage, and as to flooring removed in order to cut off the southward extension of the conflagration,—sculpture was thrown down, in the haste about saving the body of the building, and property belonging to the numerous stall-keepers, and in removing the Christmas-tree which stood near the screen ready to add its fuel to the fire. In this way alone, much loss is to be regretted: albeit many of the casts in the Palace have long been undergoing such marked deterioration, added to what they received during the original construction of the building, as to suggest the desirableness of procuring fresh casts from the originals. The whole collection of living animals, excepting a very small number of the birds, is destroyed. It included a chimpanzee, and a young hippopotamus; the latter, alone of the specimens of different kinds destroyed, was valued at 1,000*l*.

Even the architect, or decorative artist, should regret the disappearance of the bulk of the plants; which were many of them from the celebrated collection of Messrs. Loddige, and perhaps cannot be replaced. In the library were about 6,000 volumes of books, including most of those which were consulted by Mr. Jones, Mr. Wyatt, and their associates, in the production of the Fine Arts Courts.

Of that portion of the building which was the scene of the fire, nothing remains but foundations, and the columns and coupled arch-ribs of the intersection of the nave and transept, or excepting here and there a column hardly noticeable in the general scene of ruin. But the nave, southwards from the transept, to the screen, is much of it perfect; although the ridge-and-furrow roofing over the courts on each side is gone, leaving such decoration as might be made to serve again, exposed to the destructive effects of the present weather. The Hall of the Abencerrages indeed retains its ceiling; and the Cast-room, southward of it, is almost uninjured, even to the casts and the model of the original Alhambra: but the Hall of Justice, and the room of the divans, have their tiled flooring sunk down amongst the ruins of the supporting construction, and their finishing coats of ornamental plastering peeled off to a large extent by the heat; the Court of the Lions is strewn with fragments of the red tiles of the corridor-roofing; and the colouring and gilding of the walls, where not peeled off, are much discoloured, as also is the marble of the fountain. But for the discolouration, much of the decoration here might be restored, at considerable deduction from the original cost of the whole. A portion of the Roman Court, within the screen, or next the Alhambra, is also injured; whilst, on the other hand, so much of the Mediæval Courts as are within the screen may be described as perfect. The great heat of the fire is made evident by the remains of three bells, of Eastern manufacture, which hung near the gallery-stairs that led up to the Indian and Chinese collections. The material of them is found fused into irregular shapes.

Besides the Tropical Department of the main building, generally known to the public, there was a considerable extension of the basement northwards in the direction of the tower; and from this extension there was another eastward, forming the wing corresponding in position with that which is entered from the station of the West End and Crystal Palace line of railway. The north-eastern wing was divided into two principal portions, of which the easternmost was at a lower level than the other, that is to say, at the foot of the terrace. This latter portion, forming the orangery, and which is the part of the structure that was blown down by a storm some few years since, remains perfect or nearly so: the remainder of the wing, and the connecting line to the main building, form part of the general ruin. One part of the connecting line was used for storage of articles that were some of them inflammable; and the adjoining portion of the wing was used as the carpenter's shop. The great flue from the boilers of the Tropical Department ran in the direction of the tower, to the staircase of which the chimney-shaft forms the newel. This flue, carried on arches, horizontally, through the distance leading up to the storage-space, and through that very space itself, is supposed to have had much to do with the disaster, whether otherwise arising from spontaneous combustion, or from generation and explosion of some kind of gas. The truth is, however, that so many conditions and circumstances were existent to produce the fire, and there is so much difficulty in making out what was the plan of the basement, from the ruins, that we are not able to say much more as to the cause of the fire, than that any one of the conditions and circumstances might have set the train going. This only we know from the drawings of the building as it was first erected, and from what those who have visited the Palace are, most of them, acquainted with: that immediately behind the basement which forms the ground-story on the garden side, is a long roadway of communication between the two ends of the building,—in which way is the flue before referred to, or two flues similar to one another, each communicating with the chimney of a water-tower,—and that behind this space, must be another (taking, in part, the slope of the hill,) in which are to be found the supports to the iron columns, and those to the boarded flooring, the service-piping generally of the building, the hot-water piping to heat the Tropical Department, and whatever stores may be kept accessible by the traps that are to be noticed by visitors. As important perhaps as anything else, there must be in this space a great collection of dust, and, with it, some refuse, to be set on fire easily, or by spontaneous combustion accelerated by heat,—this refuse resulting from use of that really ingenious adaptation from conservatory-flooring, made by Paxton in the 1851 building,—which flooring he expected could be kept clean by the sweeping-machine,—and which he found required little more than was effected by the dresses of the ladies, even before the perfect adaptation of the garments, as recently, to street-sweeping purposes. The supports to the columns are, of course, brick; but those to the flooring, like the flooring itself, seem to be entirely of timber. This flooring was, if we remember rightly, laid down much of it after the mechanical system of building which came in with Crystal Palaces, or by mere extension of square feet of construction, without regard to possibility of modification according to size of what might have to be placed at some spot, or to weight that might have to be supported. Giving all praise to Paxton as the author of one of the finest pieces of effect that has been produced in building,—namely, the perspective of the interior of the Sydenham structure,—the fact remains, that there was no architect's work in the building, pervading it, as there should have been; and that the architects who were employed on the Fine-Arts Courts were not the architects of the foundation on which they built. The tile-flooring of the chief portion of the Alhambra Courts was, from all present appearance, laid on the wooden boarding,—instead of as Mr. Owen Jones, we may be sure, would have laid it, on brick-arching or solid concrete. But above all, the hot-water piping seems to have been laid with wooden flooring in dangerous proximity to it, that is to say, in oblivion both of the increased susceptibility to fire, by desiccation,—of which the fact might have been obvious,—but of the fact, authenticated by experience, that heat will travel to a considerable distance along hot-water pipes, even those which are at low pressure.

When the news came to the London railway-stations, on Sunday afternoon, that the Crystal Palace was on fire, and (as the report said) half burnt down, we suspect that the first impression of three persons out of four, not architects, was one of wonder what there could be in the structure to cause a conflagration. Certainly, we have the best means of knowing what were actual words of some persons. It should be apparent now to all, not only that there was a considerable amount of inflammable material in the structure, and in the contents of the building, but that, further, there is something appertaining to parts of the construction that people usually feel convinced are "fireproof," which are not correctly so designated, and which even contain elements of destruction. That the flooring of the Tropical Department of the Crystal Palace was of wood, as is the flooring of the rest of the building, may have been known to all; and many persons must have noticed places where the heat, coming through the flooring, was, comparatively with the rest of the space, intense. Those, however, who had examined the construction of the building were well aware that wood entered, in a very important degree, into the formation of the roofs and external enclosure, and into the framework of the Fine Arts Courts, as it does into the large amount of the fittings and furniture. Of course, many of the exhibited articles are inflammable.

The Handel Orchestra, alone, seems calculated to produce, should it catch fire, almost as great a conflagration as that of a theatre: indeed now, whilst the Christmas festivities are going on, there is, or including the concert-room, an amount of material destructive and to be destroyed, such as should demand incessant watching, like what there is in places of public entertainment in Paris, and, in case of fire, instant action aided by far more accurate knowledge of the conditions of inflammability and fire-conductivity than prevails generally with the constructors and the guardians of whatever public or private buildings. As to the original Crystal Palace, the opinion of the best authority on the subject of fires and fire-prevention, the late Mr. Braidwood, was very plainly expressed; and it is much to be regretted that his several statements respecting "fire-proof" construction itself, are not universally known. They are exceedingly important as bearing upon the inquiry into causes of the calamity at Sydenham, and as supplying the explanation of the picture presented by the ground over which the conflagration raged; where the utter destruction is what could not have been equalled by the burning of a building constructed with brick-piers and the best kind of timber-flooring, pugged and under-ceiled. For absolute safety, indeed, neither the system of construction adopted in different portions of the British Museum, nor the modified Crystal Palace system of the South Kensington Museum, can be considered absolutely safe; and it is to be regretted that the exigencies of lighting debar us from what seems to be the only construction that is really fire-proof, that of brick-vaulting, and solid filling-in wherever there might have been hollow space in other methods of construction, as in the formation of roofs. We cannot have features which were those of the Roman baths: yet something might have been utilized of their lessons, even in the Sydenham building; and the utilization would have involved, to say the least, avoidance of the planked and timber-supported flooring in the Tropical Department of the building. To Mr. Braidwood's conclusions we shall return.

Our own observation of the fire did not com-

mence much before half-past five o'clock, when men of the A division of police, under Chief Superintendent Walker, arrived from London. The two figures from Aboo Simbel were then burning and exposed to view; as that end of the transept, like the eastern end, and the whole of the portion of the Palace north of the transept, had fallen. Soon after seven o'clock, the writer was able to pick his way to where firemen of the London Brigade stood with the branch-pipe playing upon the wreck of the Alhambra and Assyrian Courts, and thence over broken columns and girders, past the end of the building, to the top of the wall of the place where the stores had been. Here the fire still blazed, as well as far beyond in the remains of the carpenter's shop. The fire was being revived by the rising wind; but the stream from a 1¼-in. jet-pipe, or nozzle, was being directed with telling effect. It seems wonderful that no life was lost; but the danger of buildings of iron construction is well known, at least to the successor of Mr. Braidwood and his men. Still, even at the place of comparative safety at which we stood, a stumble over the hose would have pitched one headlong into the furnace that there was some 15 ft. below; and the man at our side seemed careful to direct the attention of any of his comrades, approaching, to the danger that was in their path. The balcony at the top of the tower was burning like a beacon-light; and large fragments were falling, or being thrown down. Some of the lower floors were reported to have been on fire; but the writer saw no evidence of this in the bottom-story, which he was able to enter at the hour mentioned in one of the newspapers as the time at which the whole was on fire. If as little reliance is to be placed on published reports of the commencement of the fire, as we have found is to be given to some of those referring to its termination, there should be no dependence upon the newspapers when attempting to give particulars of occurrences not witnessed by the reporter himself, with the time duly noted. The writer of the summary of news in the leading-article portion of one paper, stated that the fire extended to the Handel orchestra. The truth is: it never extended southward of the great screen, excepting as to some trifling breakage of glass; and, as we have seen, in the nave it did not get near to the screen.

The fire was discovered by the small number of persons within the building, somewhere before two o'clock, and, independently, about the same time, by many persons outside. The latter saw an unusual appearance in the smoke of the chimney; and it is affirmed that the effect was not that of an ordinary foul flue, as also that from the great draught through the flue, the flue could not have become foul. An explosion seems to have been heard by a person passing the building; but whether the gas came from the mains, or was generated in a banked-up fire that might have been practically a retort, is not clear, more than the way in which the mixture with atmospheric air took place. It seems that, on the discovery, the policeman and fireman, inside, immediately set to work; and those outside endeavoured to gain admittance. Some time was lost before much of the large water-service of the Palace could be brought to bear on the fire. As usual in such cases, wrenches of plugs and cocks were not at hand at the moment when they were wanted; and canvas-hose proved too weak for the strain upon it. Nevertheless, some accounts say that the fire was practically got under before the first engine from a distance, one from Croydon, arrived, about four o'clock. Captain Shaw, with his men and engines, did not arrive before half-past four o'clock; or, according to one account, the time would be even later. The delay in this case is attributed to the present system of electric telegraphy; according to which, communication by the wire either is not permitted during hours when it might be especially wanted, or is made to consume more time than a despatch by train or horsed conveyance. The north-east corner of the main building, or some place near thereto, is indicated by all observers as the spot where the fire broke out. Thus, as to the main building, the fire spread westward and southward, or against the wind; and the fact of the general westerly direction taken receives confirmation from the direction in which the fallen columns lie, that is with their heads towards the east. Coming to the great stem of the *Wellingtonea gigantea*, the flames no doubt shot up the hollow, to the roof. The Queen's apartments, and the rooms for classes, in the north-eastern angle, must have been soon destroyed. The great heat acting upon the screw-ends of bolts such as form the main strength of the Paxton gutters, allowed the ends to be drawn out of the nuts; and cast-iron cracked, from several causes, such as the diminution of strength which is one effect of heat, from subjection to cross-strain and torsion which the forms had not been designed to resist, or from the application of water. Webs and flanges of wrought-iron became bent like ribbons. Of these effects of the fire on iron, the ruins afford ample illustration. Even the columns still carrying arch-ribs, about the intersection of the nave and transept, seem out of the perpendicular: so that they should scarcely be used again, excepting after being taken apart, and separately examined by competent persons. The official statement, of the evening of the fire, that the "iron framework of the tropical end is mostly standing, and apparently not severely injured," must have been written after a view from the screen only; for, certainly, the bulk of the columns are down, as well as the roofing that they carried. One of the measures attempted to stop the progress of the fire, was the cutting across the whole building, as by taking out boards of the ground-flooring, and of the floor-ing of the galleries. This cutting-out, of course, should have extended to the woodwork of the roofs and sashes,—as perhaps to some extent it did. According to the appearance of things, however, at the building now, the operation described could have stayed the fire only at some distance southward of the screen; whilst, actually, much of the nave northward has been saved.

Reverting to the inquiry into the origin of the fire, let us observe that this is one of the cases that might be well met by an inquest, such as the inquests that Mr. Payne, some years ago, held on fires in the City of London, and like the inquest on the fire of Covent Garden Theatre. At the latter inquiry, Mr. Braidwood gave very important evidence, tending to show the exceeding importance of *spontaneous combustion* as a cause of fires, and other evidence bearing upon the inflammability of desiccated woodwork. Some time ago, a valuable collection of Notes on Spontaneous Combustion, giving what were well-authenticated instances, and what were regarded as such by Mr. Braidwood himself, was published by Mr. Wyatt Papworth. The entire experience shows that whilst spontaneous ignition is generally accelerated by heat, it may take place in sawdust in contact with vegetable oil, in cotton, cotton-waste, hemp, and most other vegetable substances, and in dust-bins under particular conditions. Sometimes, heat makes the whole difference between an immunity for years, and a conflagration in the same number of hours. Paint-stores have caused many serious fires. Rags with which oil has been wiped up have proved very dangerous. Dust-bins have caused heavy losses, as in one instance where 30,000*l.* to 40,000*l.* were lost from hot ashes being thrown into a dust-bin. Mr. Braidwood said, "No collection of rubbish or lumber of any sort should be allowed to be made in any building of value."*

Can it be said of the Crystal Palace that this condition of the maintenance of a "building of value" has been observed. As to flues, Mr. Braidwood said that none should be permitted to be used from furnaces or close fires, unless prepared for the purpose; otherwise the flue might be dangerous throughout its course. As to heating by hot air, steam, and hot water, he spoke of them as "objectionable,"—one of the reasons being that the pipes are kept out of sight as much as possible. He said,—"By this means they are constantly liable to produce spontaneous ignition; for, there appears to be some chemical action between heated iron and timber, by which fire is generated at a much lower temperature than is necessary to ignite timber under ordinary circumstance." He quite recognized that fires may occur even from pipes that are left open; and he showed that the heat of water at the furnace may be more than 212°. Some fires from hot-water pipes have been known to occur after ten years of apparent safety. It is for those who are acquainted with what was the state of the furnaces, flues, stores, hot-water piping, timber-flooring, and space below the floor of the Tropical Department, to say how far any of the conditions here pointed to were existent in the Crystal Palace.

As to the sufficiency of iron-construction, useful information may be got out of a comparison of Mr. Braidwood's views with those of Mr. Fairbairn. The latter authority stated, in 1837, at the meeting of the British Association for the Advancement of Science, that cold-blast iron suffered a loss of strength amounting to 10 per cent., by an increase of temperature equal to 164°, and hot-blast a loss of 15 per cent., by an increase equalling 169°. Cases have occurred in which such an increase as the last-stated, or from 21° degrees to 190°, would have been sufficient to cause the ruin of a building. The iron beams of a floor have been known to give way from the mere heat of burning materials on tiles which the beams carried. And, a chapel at Islington being burned down in 1848, it was found that of thirteen cast-iron columns supporting the galleries, only two were perfect,—most of the others being broken into small pieces, and in some parts melted,—and that, although the pillars had been strong enough to support the galleries when filled with people, as the fire reached them they crumbled under the weight of the timber only, albeit lightened as the latter was by the fire. A knowledge of such facts will help to explain much of the appearance of the iron-work fractured, and lying amongst the general rubbish, that forms the sad spectacle which there is now on Sydenham-hill, and may serve to emphasize what would be our recommendation touching any proposed restoration of the Tropical Department, already sufficiently adverted to.

No more need be said unless in expressing hope that the directors will see their way to the restoration of as much as may be restored of the beautiful effects of nature and art-work, and the educational advantages that the Crystal Palace lately had, combined with such improvements as may lessen the chance of another disaster.

* Fire Prevention and Fire Extinction; by James Braidwood, First Superintendent of the London Fire Brigade. Including fire-proof structures, fire-proof safes, public fire-brigades, private means for suppressing fires, fire-engines, fire-annihilators, portable fire-escapes, water-supply. With illustrations. London: Bell & Daldy, 1866.

SEWERS IN PARIS.

THE great general collecting sewer of the left bank of the Seine commences at the junction of the Quai Henry IV. and the Boulevard Bourdon. It follows the line of the quays, crosses the Place du Chatelet, and, opposite the Pont de la Concorde, turns at right angles towards the north, passes under the Rue Royale, continues under the lower portion of the Boulevard Malesherbes, leaving Monceau on the left, and debouches at Asnières below the bridge over which passes the departmental road of Argenteuil. Its development is about 5¼ miles; the inclinations 1 in 2,500 from the Boulevard Bourdon to the Rue de la Pepinière, and 1 in 2,000 from that point to the Seine. In section, the height is 15 ft. 1 in. from the bottom of the invert of the canal to the crown of the arch, which is elliptic; the width is 18 ft. 5 in. at the springing. The canal at the level of the two *banquettes* on each side is 11 ft. 6 in. wide, and 4 ft. 5 in. deep. The masonry is of *meulière*, laid in hydraulic mortar, the whole being lined with Vassy cement. There is no dressed stone used in the construction.

This sewer receives, at the Boulevard Haussmann, what is termed the collecting sewer of the hill-side. Running parallel to the circular railway, this latter turning off from the route Impériale, No. 34, or Avenue de Vincennes, traverses the Rue du Faubourg St. Antoine, at the commencement of the Rue de Montreuil; after having touched upon the Boulevard du Prince Eugène, the Rue du Faubourg Poissonnière, at 400 mètres from the boulevard, and the Place du Havre, it gains the debouche above mentioned in the neighbourhood of the Rue de la Pepinière. Thanks to the 2 mètres difference of level between the Place du Châtelet and Asnières, the level of the invert of the new sewer can be made 2 mètres lower than that of the ancient sewers, and the cellars can be drained in that part of Paris which lies beyond the so-called hill-side collector.

The Sebastopol sewer, which establishes a junction, under the boulevard of that name, between the great collector of the right bank, and the contouring collector, allows the surplus and storm waters of a great portion of this side of the river to be poured into the Seine. Besides this there is the Rivoli sewer, another affluent of the great collector, which can divert the overflows to the Seine, when otherwise the streets would be flooded, at the Quai de la Con-

férence, and thus relieve that part of the great collector which lies below the Place de la Concorde.

In sewers through which a large body of water flows, cleansing them by manual labour and sweeping is out of the question; so recourse is had to a boat provided with a vertical board which exactly fits the section of the canal. This board is placed at the head of the boat, and is pierced with holes; it can be raised or lowered at pleasure. Carried by the current, this board or sluice forms an obstacle to the passage of the water, and there results an eddy which gives an impulsive force to the board, so that it pushes before it the solid matter deposited on the invert, but restored to a state of suspension by the fillets of water which pass through the holes.

The result is, as experience has proved, that this sluice-board amasses before it the sandy deposits, leaving a horizontal column in suspension, generally from 100 to 150 mètres long. If a pole be immersed in the water above stream, it will touch the bottom, and the masonry will be found clean and free from all deposit. On the other hand, if the pole be placed at the other end of the boat, it will penetrate a heap of muddy deposit, and stand upright of itself; it will also remain upright, and drift along with the boat and the heap of deposit.

Thus the boat travels of itself, under the superintendence of two workmen. Its rate of moving is variable, and does not exceed in general two feet a minute. In winter these boats, which have relays at every two kilomètres, work day and night, and it is not too much for the requirements of the cleansing.

In the canals of small section, as that of Sebastopol, the boat is replaced by a chariot, running on rails laid on the *banquettes*, and carrying also a flushing board. The deposits of the sewers are carried down as far as Asnières, where a sort of bar or delta is being formed, which must be removed by dredging, and can be utilised for agricultural purposes.

The quantity of water passing through the great sewer is, as may be supposed, extremely variable; it is generally 1 mètre per second, giving 4 cubic mètres or 140 cubic feet per second. This velocity, according to the usual hydraulic data, should roll stones the size of an egg, but the viscous nature of those sewage deposits—street-sweepings containing much organic matter—prevents the water from carrying off anything that is not mechanically stirred up into it.

These sewers are liable to inundations like rivers, by sudden torrents of rain, so that the vault is widened out at every 2 kilomètres, and stairs or ladders are provided leading to safety-chambers.

The total length of all the sewers in Paris is, up to the present time, 294 miles.

Great exertions are made to terminate the great collecting sewer of the left (south) side of the Seine. It will absorb the Bievre river, cross the Seine by two tubular syphons of enormous diameter at the Pont de l'Alma, follow the Avenue Josephine, pass under the Place de l'Étoile, and, traversing the district of Courcelles, will fall into the Seine at Asnières, a little above the point where the Chemin de Fer de l'Ouest crosses the river. Thus the Bievre will join the Seine seven miles lower down the river than it does at present.

OFFERED PRIZES FOR DOING GOOD.

THE PARIS EXHIBITION.

OUR readers know that a distinct order of reward has been instituted "in favour of persons, establishments, or localities, which, by a special organization or special institutions, have developed a spirit of harmony among all those co-operating in the same work, and have provided for the material, moral, and intellectual well-being of the workman;" and that these rewards consist of ten prizes, of the total value of 4,000*l.*, or 400*l.* each, and twenty honourable mentions. One grand prize of 4,000*l.* may, in addition, be awarded to the person, establishment, or locality, distinguished under this head, by a very exceptional superiority. At the first meeting of the International Jury, held in Paris, on the 1st of December last, certain principles were adopted, and we print them as serving further to define the object:—

"1st. The jury may doubtless take into account among the facts presented for its consideration, the spirit of charity and beneficence; but it is not specially charged to reward acts of that character.

2nd. To constitute them the basis of a claim to reward, the facts adduced must have been the consequence of a free and spontaneous initiative, and not of legislative enactments.

3rd. It will not suffice that the work be praiseworthy in itself; it must at the same time be compatible with sustained and progressive prosperity.

4th. The circumstances of the position in which competitors may be found should be duly considered. To have maintained intact traditional circumstances of harmony and happiness, whilst progressing in agricultural or industrial pursuits, is a good ground of claim; but the introduction of improvements where antagonism and suffering previously existed is not less meritorious.

5th. The jury has not thought it right to exclude from the competition individuals or societies which, although not engaged in agricultural or manufacturing pursuits, have founded durable and prosperous institutions, contributing to the propagation of good feeling and happiness, of which it is desirable to seek the best examples."

We are anxious that these prizes should be widely known of, and well understood, so that claims may be made for as many organizations and individuals in Great Britain as fairly comply with the conditions. Blank forms are obtainable, we believe, at the South Kensington Museum, and the claim must be lodged there on or before the 20th inst.

THE MONUMENT FOR THE CANADIAN VOLUNTEERS KILLED BY THE FENIANS.

THE citizens of Toronto having determined, at a public meeting, to erect a monument to the memory of the volunteers killed at Limeridge, on the 2nd of June last, in repelling the Fenian scoundrels, appointed a committee to carry out the arrangements. In answer to advertisement the committee received sixteen separate designs, from which they selected one by Mr. C. E. Zollikoffer, of Ottawa, as first in order of merit; and awarded to it the first premium, the second being given to Mr. J. Smith, of Toronto. The selected design, which is to be erected on a site in the Queen's Park, Toronto, is a square temple, formed by twelve Corinthian columns on pedestals (three at each angle ∴), which carry an entablature and pediment on each of the four faces. The tympana of the pediments are to be filled with the royal coat of arms, the arms of the province, and the arms of the citizens of Toronto and Hamilton respectively.

Within the inclosed area at the four angles formed by the columns will be life-sized statues illustrating the four branches of military service; and in the centre will be a sarcophagus, supporting a figure of Britannia reclining on a demi-lion couchant, mourning the loss of her subjects. The roofs of the four pediments carry at their intersection a pedestal, with a crowning figure of "Victory" 12 ft. in height.

The whole of the carving will be executed in freestone from Nova Scotia; the shafts of the columns and the sarcophagus will be of Arnprior marble, and the remainder in Halton freestone. The floor will be laid with encaustic tiles. The monument will be placed effectively on a wide spreading basement, consisting of a sloping embankment, with steps in the centre of each face, and on that a pyramidal flight of steps, which continue up between the pedestals (or rather the broken podium) on which the columns stand, so that the floor of the monument will be level with the bases of the columns.

While we give praise to this "planting" of the monument, and to the general proportions of the structure as a whole, we must raise a voice against the crowning figure and pedestal standing on the roof as they do. The apparent weakness of the arrangement will be excessively unsatisfactory and disagreeable. If carried out it will be a lasting offence to every tasteful eye in Toronto. We trust this observation will lead Mr. Zollikoffer to reconsider and alter this portion of his design.

ART NOTES FROM FLORENCE.

WHEN on the 15th of December the Italian Parliament was opened by the king, in the Great Hall of the Palazzo Vecchio, a brilliant sun and most mild temperature contributing to the happy auspices of the day, as well as to the beauty of the scene presented in the line of streets from the Pitti Palace to the Piazza della Signoria, all the ingenuity and taste of the Florentines in decoration, all possible devices, trophies, banners, and tri-colour hangings, had been profusely prepared for the occasion. In the centre of the great piazza stood a lofty mast, with the national standard, and around its basement statues of Prudence, Justice, Temperance, and Fortitude, prepared in the usual style for such ephemeral art-works. In the loggia of Orcagna was a gorgeous display of all the Italian banners and embroidered epigraphs, that seemed to convert those majestic arcades into a festive pavilion. But in the midst of the ornamentation for the day, under the vaults of Orcagna's structure, stood a nobler object now attracting more attention than all the apparatus of fête, for on the morning previously had been uncovered the colossal group, by Fedi, of Pyrrhus sacrificing Polyxena, raised on its basement here so long since as the 2nd of October, but up to this time concealed by a high wooden shed, within which were finished the works for encrusting that basement with marble. It comprises four figures—the Pyrrhus carrying the hapless girl to the altar for sacrifice; the Hecuba prostrate, in vain intercession for her child; and a youthful son of Priam stretched in death, as just struck down at the conqueror's feet. It occupies the extremity of the loggia, near the Palazzo Vecchio, in position correspondent to that of Gian Bologna's "Centaur," at the other side; and it is only to be regretted, that in this otherwise most favourable location, a part of the group is concealed to the spectator standing in front of the archway, at whose centre it rises, as seen from the piazza, by the intervening figure of Cellini's "Perseus" above the parapet between the great pilasters. This admirable group having been, long since, purchased by subscription of the citizens to become a public ornament to Florence, and destined by the Municipality for its actual place, the voice of criticism has already been heard from various quarters, and little notice has been taken of it by the journals since its exposure, except simply to announce the fact. We happened to find ourselves on the piazza at the moment of the uncovering, about eight o'clock on a dull, wet morning, and were surprised to see so little attention excited, so complete an absence of *éclat*, in the whole proceeding. As to the merits of the work we have formerly expressed ourselves. In tragic power, movement, and just equilibrium, in all the technical qualities, it strikes us as faultless; in the heroic beauty and action of the Pyrrhus, the sad loveliness of his victim, and the pathetic character of the mother's figure, the story is conveyed with dramatic truthfulness. But the subject is revolting, and, perhaps, incapable of being exalted by any merits of treatment; and as the most historic centre of the Italian capital, an episode in the siege of Troy, and one that illustrates the withering force of superstition alone, redeemed by nothing of patriotism or magnanimity, seems to the last degree unsuitable. As a classic motto for such a group, we can think of no line more appropriate than—

"Tantum religio potuit suadere malorum."

And, to criticise details, the fault generally found is one that all may perceive in the disproportionate slightness and diminutiveness of Polyxena compared with the warrior who raises her figure with the left arm while aiming a blow with his sword (an unnecessary atrocity) at the prostrate Hecuba; also, a heavy and clumsy appearance in the drapery that covers the lower part of the mother's figure; and a certain rhetoric action in the left arm and hand of this unfortunate young princess, as she vainly struggles in the grasp of her destroyer. But neither these, nor the more serious moral objections to be urged, can forfeit for Fedi's work the high place now assigned to it by public opinion, nor prevent us from awarding the tribute of praise due to the classic grandeur, the blending of power and grace, in the whole composition.

A detail now observable, and a novelty since we saw this group in the studio, is the tinting of the nude parts with a pale pinkish colour, *approaching*, though, indeed, but faintly, to that of flesh, and which adds a warmth without impairing the purity of effect. We may describe this more precisely by stating that, from a distance, it is but the natural hue of the marble, only, from nearer points of view, what is artificial strikes the eye.

The other monumental sculpture of recent origin in Florence, the colossal "Dante," on the piazza S. Croce, by Pazzi, was uncovered so far as to display the principal figure, though not the reliefs and accessories, a few days ago; and we understand that the artist will soon have ready the four bas-reliefs illustrative of the "Divina Commedia," for the basement, and the lions to

be placed at its angles. Public criticism has found fault with the mournful and severely indignant expression of the head as unsuited to the triumphs of apotheosis, in which the poet is here before us; and the more youthful, the more serene type supplied in Giotto's fresco might have been preferable for the Dante of this movement; but it should be remembered in Pazzi's justification, that his statue was not begun or ordered for the appropriation by which it has been finally honoured,—an afterthought not to be foreseen in an undertaking guided by personal feeling. The Minister of Public Instruction has interceded for the careful preservation due to several frescoes by Poccetti and his school in the vaults of rooms lately abandoned, after being used for custom-house purposes, in the Casino Medicis, a once grand-ducal palace on the piazza S. Marco; and the municipality has exerted itself for a like interest, ordering the transfer to the Mediæval Museum in the "Pretorio" of a Crucifixion, in fresco, attributed to Andrea del Castagno, and of unquestionable merits, hitherto left in a niche under glass on a wall of a fortifying cincture soon to be taken down, near Porta San Gallo. The same minister lately ordered, and with laudable purpose, the drawing up of a map of excavations, to serve as guide, not only for all places where such labours have yet commenced, but for all to which it is judged that explorers should direct their attention, in hope of archæologic discovery; and antiquarians of repute—Conestabile, Fiorelli, Spano—have already pledged their assistance for this desirable object. In the range of such discoveries we hear of diggings carried out with valuable results by an enterprising arch-priest of Vado, near Savona, who, on his own risk and speculation, as it seems, began the works near his church for seeking the extant remains of Vado-Sabazia, a Roman city, soon brought to light in various interesting ruins and antique implements; an aqueduct with leaden conduits passing under a mountain to the extent of 1,400 mètres; the pavement of streets, still with the ruts of carriage-wheels, and besides piles of formless ruin; some marble busts of different size, amphoræ, specimens of glass manufacture noticeable among those of antique produce, marble lamps, epigraphs, and coins in chronologic series from Tiberius to Valentinian. Amidst other circumstances of public life, such a treasure-trove might have excited greater interest and been more fully reported on: as it is, we must satisfy ourselves with very scanty notices in journals respecting the hitherto labours and successes of the reverend *padre*, among those relics of Vado-Sabazia, which have followed the vicissitudes of one antique object, the Iron Crown of Italy, to which intrinsic importance is attached; and have now to mention its restitution with much official pomp and ceremony, received by capitular clergy, the Prefect of Milan, and the local magistrates, to the basilica of Monza, 7th of December; also, the presentation to the King of a casket to contain his crown, wrought with much artistic skill by Montenari, of Perugia, from which town it was brought to Florence by a deputation of chief citizens. The idea of a preparatory exhibition at Florence, of works to be sent to Paris, is quite abandoned. An English artist, long resident here, Mr. Bunney, has been exhibiting a set of water-colour landscapes and peasant-life scenes, from subjects in and around this city, prior to their being sent to London, for the display in Piccadilly: altogether a pleasing series of records of Tuscany. Mr. Stark, another English artist long here, who is considered to have imitated the colouring of Titian with signal success in his numerous copies from that master, has lately finished an original picture, "Venus standing in a Shell," that evinces his best capacities, and has been much praised.

THE STAGE AND MUSIC.

The Haymarket.—A promising boy leaves the quiet home, goes to college, and is a "man" exposed to many temptations and left to himself for defence. He is led into extravagances, falls into debt, makes the acquaintance of money-lenders, loses his chance for "honours," and half ruins his father. This is the story (it has occurred in hundreds of instances, and will occur in hundreds more), well told by Mr. Tom Taylor in his new comedy, "A Lesson for Life," now being acted at the Haymarket, Mr. Sothern playing the hero, *Harry Vivian*, Mr. Chippendale his father, and Miss Moore, with much delicacy, a ministering angel in the shape of his cousin. Mr. Sothern shows himself in this piece an admirable actor. His ease and naturalness of manner in the lighter parts of it are perfect; but when he desires to become more impressive, he is more artificial, and must guard himself against seeming to "preach." Mr. Walter Gordon plays with great heartiness an undergraduate friend of *Vivian's*. The piece is well written, sound in structure, and very interesting. Mr. Compton, Mr. Howe, and Mr. Kendal, a promising young actor, help in it.

The Princess's.—Mr. Planché's capital extravaganza, "The Invisible Prince," has been revived here very successfully, Mrs. John Wood playing the principal character with great dash and cleverness, and Mr. G. Honey, the very bad *Prince Furibondo*, with much original humour. This piece was first played twenty years ago, and when we say that it has been reproduced without the alteration of a line, and goes admirably, the difference in the extravaganzas of those days and the burlesques of these is made evident. The piece has been produced by Mr. Vining, with rich appointment, and Mr. F. Lloyds has painted for it some capital scenes. We must note especially the last, the elegance and beauty of which are remarkable.

A Concert for Charity.—The proceeds of a concert, to be given by Mr. Henry Leslie this (Saturday) evening, the 5th, in St. James's Hall, are to be applied to charitable purposes. All the *artistes*, including Madame Sainton-Dolby, Madame Lemmens-Sherrington, Mr. Santley, and other eminent singers, will give their services gratuitously.

THE ACCIDENT ON THE METROPOLITAN RAILWAY.

THE inquest on the three persons killed by the fall of a girder from the Smithfield market works on the metropolitan railway has resulted in a verdict of manslaughter against the foreman, Wilmot, and the ganger, Chaney. It appears that no arrangement whatever existed for staying proceedings while a train was passing below, although the steam of the engine prevented the workmen from even seeing what they were about at the moment. From the evidence it seems clear that the girder was pulled, by a donkey engine, too far across the other girders, till it lost its balance and canted over; and there was not even a check rope to regulate the speed or the progress of the girder. It was admittedly improper to use the donkey engine at the moment of the misadventure, and it pulled the girder several feet forward at a time when it ought not to have gone more than one foot.

ACCIDENTS.

Manchester.—A partition wall, in the rear of the warehouse of the Messrs. Berhen, Brothers, Oxford-street, has fallen, killing one man almost instantaneously, and injuring six others seriously. The seven men were labourers in the employ of Mr. Davis, contractor, and they were engaged at the time in removing a quantity of *débris* that was lying about, preparatory to an extension of the premises that have their front in Bale-street. The partition wall, the only one which has been left standing, was about 40 ft. in length by 20 ft. in height; and this served as a front, two stories high, to some premises in the inner portion of the property.

Edinburgh.—The temporary service bridge at Abbeyhill, erected for the formation of the new branch of the North British Railway from Edinburgh to Leith and Granton, has fallen, burying in its ruins two men, a couple of horses, and two wagons filled with sand. The bridge was constructed of beams, about 15 in. square, covered with sleepers and rails, for the purpose of conveying earth and other material to form the embankment now in progress. Mr. Grainger, the contractor for the works, had given strict orders that not more than one wagon should pass across the bridge at a time, which order being neglected was the cause of the bridge giving way. On the men being taken out, it was found that both were only slightly injured: neither were the horses much injured.

Leeds.—During a late gale of wind and rain an iron church, in course of construction, on Hunslet-moor, for temporary use until the completion of the permanent stone church now being erected there, was blown to the ground. The temporary edifice was being built of galvanised iron, for the accommodation of about 300 people, at a cost of about 300*l.*, and the skeleton of the structure had been fixed and the roof covered in, but the whole of this was demolished, and part of the woodwork permanently injured. The damage done is estimated at about 30*l.* or 40*l.*

Durham.—A labourer employed in building the Gaol wall was standing on a plank on the scaffold, when he got too near the end of the plank, which toppled up and precipitated him on to the ground, from a considerable height. He fell upon his head, which was much cut.

Ardingly, Sussex.—An inquest has been held into the circumstances attending the death of a bricklayer, who was killed by falling from a scaffold. Deceased was working on the scaffolding of some new huts, and was in front of a fireplace laying bricks. While stooping to take up mortar, he fell forward to the ground, face first. A surgeon deposed that he saw deceased, but could distinguish no bruise or fracture whatever. In his opinion deceased died from breaking his neck by the fall. The jury returned a verdict of "Accidental death."

THE THOMAS MEMORIAL, LLANDAFF CATHEDRAL.

A MONUMENT in memory of Mr. Henry Thomas, many years chairman of Quarter Sessions, Breconshire, has been erected in Llandaff Cathedral.

The design and general execution of the monument are the work of Mr. Prichard, architect. The reliefs were designed by Mr. Armstead, and executed by Mr. Clarke, of Llandaff. The monument occupies a deep recess in the wall of the north aisle, beneath the first window from the west end. The recess is fronted by two low-pointed arches, having a rich moulding of sculptured flowers, and springing from a central and two lateral columns of dark variegated marble. The capitals, bases, and other mouldings are of oolite, as are two outer piers which flank the whole, and support a square hood, the central spandrel of which is occupied by an armorial shield within a sunk foliated circle, while on either side are seated figures of Justice and Mercy, carved in relief. Within the recess is vaulted in two bays, with ribs along the lines of groining, springing from foliated corbels. Upon the raised floor is laid a coffin-shaped slab of black marble, upon which is inlaid a red cross, adorned with a nimbus, and having at its foot a Paschal Lamb in Sienna marble. The tympana, formed by the two vaulting bays, are occupied by carvings in high relief; one representing the Delivery of the Law by Moses, and the other the Judgment of Solomon. Below, between these and the floor, is the inscription.

A large three-light window above the monument is filled with stained glass by O'Connor, in memory of Evan, Henry, and Llewelyn Thomas, representing the three last generations of the family.

GREAT NORTHERN BRICK COMPANY.

THIS company, formed some twelve months since for the purchase and development of works at Arlesey, near Hitchen, for the manufacture of patent perforated and solid white bricks, have now nearly completed their buildings, which are on an extensive scale. The machinery will consist of two horizontal high-pressure steam engines, working up to 50-horse power each, and having boilers 30 ft. long and 7 ft. diameter, with brick-machines, crushing-rollers, and appliances, and capable, it is stated, of making from 20 to 25 millions of bricks in a year. The bricks are dried by steam power in inclosed sheds. The whole of the shares of this company are sold. The works have been carried out at a cost of some 20,000*l.* Mr. C. N. Foster, of Whitefriars, was the general contractor. The engines, mills, clay-rollers, and machinery were supplied by Messrs. Garforth, of Dukinfield, Ashton-under-Lyne; the iron roofs by Messrs. Hemmings. The buildings, drying-sheds, kilns, and all arrangements of machinery and construction have been carried out from the designs and under the supervision of Mr. John Ellis, architect.

NATURE THE STANDARD OF TRUTH IN ARCHITECTURE.*

IT is not in my power, and I doubt if it be in the power of any one, correctly to define the limits where architectural truth ends and falsity begins. It is said "there is no disputing in matters of taste;" and art is so much a matter of feeling that it would be impossible to set down fixed rules which would be universally acceptable. The very life of art depends upon its freedom; like knowledge, it has no limits but those of necessity; and good taste is shown by the moderation and propriety with which that freedom is used. I propose, therefore, to submit to you some of the restraints which you should put upon the freedom allowed you (for the mind is as easily enfeebled by too much latitude as by constant restraint); and in what way you should look to nature as your pattern and guide; and the reason why I would have you to look there for guidance is, that it is there, and there only, where you can find works which are in themselves perfect.

If art, then, is to be judged by the standard of nature, it should be true; for there is nothing false in nature,—absolute truth is an attribute of the Great Architect.

A fine building must have certain qualities to render it interesting and worthy of being ranked amongst the efforts of genius; and these qualities will depend upon the bent of the designer's mind; whether or not he is earnest in his profession, and looks upon it as a noble one, demanding some sacrifice on his part, or whether it is to him *merely* a means by which he may earn his daily bread. To the last class of architects I have nothing to say; they are tradesmen, and not artists; they will never produce anything great, for their sordidness is certain to show itself in their works; the hand cannot execute anything higher than the mind can inspire. Do not for a moment suppose I wish you to work for fame only, such is not the custom in these our days; but as surely as you keep a high aim in view, and have the ability to reach within a moderate distance of it, so surely will your reward be the greater, even in a pecuniary point of view.

The first thing to be considered in designing a building is its situation and purpose: if it is to be a large one, breadth and simplicity should be aimed at; if small, richness and elegance. Such, you find, is the characteristic of the works of nature. The vast expanse of the ocean stretching away to the horizon, the mighty mountains "baring their naked shoulders to the sun," the ragged rock, and the knotted oak, all teach the lesson that breadth and mass are the elements of the sublime. A large structure formed of numerous minute parts can never be grand; in it detail should be subordinate to mass, so that when viewed as a whole no part should obtrude itself upon the eye.

The mountain side is studded with harebells and mosses, lichens and heath; but these are unseen when its bulk fills the sight: it is only when you ascend its slopes and peer into its crevices that these present themselves to your notice; and when you reach the summit the barren rocks and everlasting snow repose there in solemn grandeur. Place, then, rich and minute ornaments on your grand structure where the eye can search them out and rest upon them without fatigue, and aim after broad lights and deep shadows.

And with what profusion does Nature deck her minuter creations: the spotted butterfly flitting from flower to flower on its fragile wings, the flowers on which it rests, touched with a delicacy the limner strives in vain to imitate, the spangled breasts and glittering wings of the feathered tribe, all point to the fact that small objects are those most richly decorated. Reverse this order of nature and you produce monstrosities; a butterfly the size of an eagle would be ridiculous—an eagle reduced to the size of a butterfly contemptible. Roslyn chapel increased to the dimensions of Durham cathedral, and the cathedral reduced to the dimensions of the chapel, would, in like manner, upset all ideas of fitness and propriety. And yet some of our modern designers do not perceive even this plain and palpable truth. In our cemeteries we see temples with columns the length of a walking-stick, and sarcophagi capable only of containing the dust of a sparrow. In close affinity to this is the practice of "using models of architecture to decorate architecture," which, says Mr. Ruskin, "is one of the chief follies of the Renaissance; and, in the present day, the practice may be classed as one which distinguishes the architects of whom there is no hope."

In nature you ever find that the means are the best adapted for the object in view. It is almost superfluous to illustrate this proposition. I need only refer you to your own bodies, "fearfully and wonderfully made." Can any of you suggest—dare any one of you think it possible he could improve upon that wonderful mechanism? Is not each part the most suitable for the functions it has to perform, each having a direct relation and proportion to the other, all being in harmony without and within? In how few instances do we find this to be the case in the buildings we see around us; the exterior often bears no relation to the interior, being often unsuited to the climate, and ill-fitted for the purposes for which it is intended. Look at that Doric temple, divided into numerous small rooms. It has an upper floor, though you would not think so till you found it out on entering the vestibule. See the vain attempt to hide the chimneys, features capable of great beauty, but not being classical ones, they must be ignored and, if possible, kept out of sight. It is a fine building, doubtless, displaying much classical refinement, but it is nevertheless a sham. Look we next at this other building; it is Gothic—Gothic with a vengeance! Every available angle has a little turret attached to it; the roof bristles with little domes of every variety of form; and you look in vain for any morsel of rich detail or carving on the face of the barren walls: these turrets are useless in themselves, worthless as a decoration, an excrescence better lopped off. Here, too, at the lodge you have them repeated on so reduced a scale that they had to be built solid. Is this art? is there thought displayed here? any attempt to adapt means to an end? I leave you to form your own individual judgments on the subject.

The Middle Ages were characterized by a restless and vigorous spirit, and earnest and truthful love of the beautiful, which found vent not only in architecture, but in the chivalric devotion to the fair sex, the pomp of the tournament, and the romance of the Crusades. And when Greece was at the acme of her greatness, when philosophy and patriotism were more loved than luxury and self-aggrandizement, art flourished and she produced marvels of beauty, subjects worthy of the closest study, full of the spirit of harmony, replete with subtle refinement. Think you the refined Greek would have stuck ugly black tubes on the roofs of his temples, for the smoke to escape through, had such been necessary? Would he not rather have sought how to decorate what was a constructive necessity, and produced a "thing of beauty?" This is the spirit in which I would have architects act, not to copy Greek or Gothic, but to design what is required. If it is not in their power to do so, then it cannot be helped. The true artist will not content himself with merely copying details, but, having imbibed the spirit of the style, he will design for himself, producing new combinations, and securing variety and originality. In our ancient baronial mansions we find that the turrets were constructed for defensive purposes, and were accessible from within, and they now form snug retreats and convenient closets for their modern occupants; they were not excrescences, but useful features decorated.

It is not always possible to make a building outwardly express the purpose for which it is erected, but it is often made to appear what it is not. The façade of an Italian palazzo placed in front of a series of iron sheds roofed in with glass is made to do duty as a corn exchange, the one part having no relation to the other: here if anywhere an architect has a subject on which to exercise his originality, he has no precedent to trammel him, no tradition to follow, and he has all the produce of the field as suggestive detail; but imitation is easier than creation, and up goes the false front! It is not necessary to truthfulness to exhibit construction. Nature clothes with beauty all that is unseemly, however necessary it may be, but she never places the covering appertaining to one object upon another; the skin of the leopard is never seen on the tiger, nor the bark of the oak upon the birch.

A perpetual exhaustless vitality is one of the most prominent characteristics of Nature: she hates uniformity, and delights in variety; each hill and valley has a different outline; no two trees are alike; every sheep in a flock, the shepherd tells us, he can distinguish by headmark, and seldom indeed do we see two human beings so much resembling each other as to be scarcely distinguishable. It is not at all probable that a real "Comedy of Errors" will ever take place; two Dromios, each having an Antipholus for master, are not likely ever to be found in the history of our globe.

The craving after uniformity I conceive to be a most unhealthy sign. What a dull prosaic place this beautiful world would become if some folks had their will! But with all their striving they cannot produce perfect uniformity: nature rebels against it. The very stones from the quarry, to their great disgust, assume a variety of tints by exposure to the air. They erect uniform rows of buildings, and one inhabitant, requiring more accommodation, adds a story to his quota, and another erects a porch in front of his, and the cherished uniformity disappears. If you will put rows of houses in uniform, do let some individuality appear on the *face* of each dwelling. The eyes of all the soldiers in a regiment are not of the same colour, their noses and mouths are not all of the same contour, let the War Office regulations be as strict as they may; nor, were they so, would the corps appear to greater advantage, or the men be better soldiers. Give us, then, some variety in the window-dressings and doorways of our terraces and squares,—make them uniform in style, if you will; but give us some little variety in detail. And what sacrifices you have to make in order to produce this uniformity! Windows are placed where they are not wanted, and they are absent where required. Let us ascend this common stair. Here we are at the landing. What means this? Half of a window at our feet and half of another above our heads, and a solid wall where the greatest amount of light can be admitted. What means this absurdity? "Oh," you reply, "it is in order that the windows may appear on a uniform line in the street elevation." And is the effect good, after all, on the street front? I think not. In my humble opinion, a little variety in the line of windows would give some life to what is dull and monotonous. I could point to a public building in this city where a mock chimney-stalk is built upon an iron girder, merely because a true chimney occupies a similar position upon another part of the façade; and this very building has been held up as a specimen of common-sense, unpretending architecture.

It appears to me that we derive an amount of pleasure in contemplating a building corresponding to that which the architect derived in designing it, and to the amount of thought he displays in so doing. Speaking for myself, I can say that some buildings abounding in faults afford me more gratification than others which are comparatively free of such. I would rather see a work amenable to severe criticism than one which is commonplace and devoid of interest. Such I conceive to be the reason so much interest is attached to the works of the Mediævalists, some of which, if repeated now, would be looked upon as rude and unworthy of notice. It is for the same reason that work cast from a mould and repeated is so lifeless as compared with the handiwork of the artificer; and the too general use of the compasses in drawing mouldings and details produces a similar result. The sketch has more life and spirit than the finished drawing. Music produced by machinery may be perfectly correct, but it cannot be expressive. On the other hand, there is often too much effort and too little thought shown in our modern work; a small church has the details of a cathedral crowded into its moderate limits, the parts elbowing each other in the most uncomfortable fashion. The effort to be picturesque is seldom successful; picturesqueness is generally the result of accident, the work of different minds, a combination of grouping and light and shade, which was unforeseen; where, however, a picturesque result has been secured by the effort of the designer he deserves a high rank as an artist. A picturesque result may be very easily spoiled by the introduction of a fresh object into the scene; and this leads me to remark that there is often too little consideration shown by an architect for the works of his compeers: the aim seems to be how to overpower the existing work by the greater pretentiousness of the new; but, in most instances, the attempt recoils upon the delinquent, the result being altogether unsatisfactory. Strive rather to produce pleasing combinations; sacrifice some of your own prepossessions for the

* From a paper by Mr. W. G. Shiells, read at a meeting of the Edinburgh Architectural Association.

sake of others, and you will, in the long run, derive greater satisfaction than by following the opposite course.

The revival of ancient symbols in the decoration of our churches, is, I think, a species of untruthfulness. When these were in general use the laity were ignorant of the use of letters, the invention of printing had not opened the gates of learning to the masses, hence the necessity of teaching by means of symbolism. To the majority of the people of this century these symbols are a dead letter: to the antiquary and the archæologist they form an interesting study, affording a pleasant field for investigation; reproduced in modern work, they are as much out of place as contorted figures introduced into new stained glass. There are some symbols, however, such as the lamb, the dove, and the cross, the meaning of which is obvious, and which are beautiful in form: to the introduction of such there can be no objection: I refer to those hieroglyphics which only the initiated can understand, which few take the trouble to decipher, and which are not good in form, or worthy of being used as simple decorative features. I make these remarks with diffidence, as it is much a matter of feeling, and some seem to derive pleasure, and it may be profit, from the practice.

Feeling is the source and fountain-head of all true beauty in art. The strictest adhesion to rule will not make a designer an artist: as well attempt to write a poem by rule as to design a beautiful structure by rule. Unless the poet's soul be in the man, his work will be prosaic. He must have experienced himself the sensations he wishes to create in others. A man may be deeply learned and a profound thinker; but, unless he is endowed with a peculiar organization, and has special qualities of mind, he will be deficient in taste, and remain blind to much that is beautiful in art, and which is keenly felt and easily discernible by a less gifted mind.

We are at the beginning of a great social era; social forms are rapidly changing, and wealth is increasing in the land to an unprecedented degree; the love of art is spreading, and the skill of the architect is more and more in request. It rests with yourselves what use you will make of your opportunities,—whether you will lead or be led by your clients, whether you quietly acquiesce in demands for what you know to be bad art, or whether you will strive to plant a little piquancy into the too general commonplace. Many of you whom I am addressing are at the outset of a noble profession. You will either leave behind you works which will be a source of pleasure to future generations, and which they will love and cherish, or things which will encumber the earth, and which they will be eager to clear off its surface as blemishes. Be earnest, be truthful; let everything you do be the best of its kind that you can do. Your productions should last for ages, and teach others as you have been taught. "The true secret of genius is to suffer no fiction to exist for us; to realise all that we know in the high refinement of modern life, in arts, in sciences, in books, in men; to exact good faith, reality, and a purpose; and first and last, and without end, to honour every truth by use."

SCHOOLS OF ART.

The Stourbridge School.—At the annual meeting of this school the prizes and certificates gained by the students were distributed by Mr. H. W. Foley, M.P., who presided. The report of the Council stated that the works executed by the students during the year, showed that satisfactory progress had been made. The number of students continued to increase, but it was a matter of regret that so few glass-makers entered the classes. The present system of Government examination of drawings had been as beneficial to the students as to the school. The result of the elementary examinations at Oldswinford, under Mr. Rainbach, had been highly satisfactory. The report further stated that Mr. Keen had been appointed assistant-master, in the place of the late Mr. Rose.

The Chester School.—The students of this school recently presented to Mr. E. A. Davidson, their head master, a token of their regard on his leaving Chester, after filling the situation of head master of the school for nearly fourteen years. The chair was occupied by Mr. Griffiths, assistant drawing-master. An address to Mr. Davidson was read by one of the senior pupils, asking him to accept, as a small token of their regard, a handsome inkstand, in walnut wood. A small silver plate on the inkstand bore the inscription. A number of gentlemen, also, who have been connected with Mr. Davidson in his capacity of a professor of drawing, together with a number of the elder pupils of the Chester School, have presented Mr. Davidson with an English skeleton timepiece, embellished with a figure (in gold) of her Majesty the Queen, and 50*l.*, in recognition of that gentlemen's services as master of the School of Art. The Mayor presided.

The Manchester School.—The annual distribution of prizes awarded by the Department at South Kensington, to students in this school, took place in the lecture theatre of the Royal Institution; Mr. Thomas Bazley, M.P., president, in the chair. There was a numerous attendance of ladies and gentlemen. The Chairman said he could not omit noticing the works contributed by the female students: they were certainly running hard in the race, and he felt sure he should only be doing justice to the male students if he said that, in the spirit of gallantry, they would be glad to be eclipsed by their female competitors. To the teachers a great debt of obligation was due; and to Mr. Muckley, the head master, in particular, because he had not only been the instrument of teaching the young how best to pursue their studies, but had contributed beautiful works in the exhibition which now adorned the Royal Institution. He was glad to hear that at present the school numbered some 300 students, for every one of those students he regarded as a missionary of good and refining taste, as well as a missionary for the elevation of his fellow creatures. Mr. W. J. Muckley, the head master, then addressed the students on the subject of their studies. He said that patience must enter as an element into all their efforts. For the most part, success was measured in everything by the patient endurance one could bring into the composition of one's labours. It mattered not whether the student might be artificially engaged or otherwise, the ingredient of patience must be largely in the compound of all studies in order to ensure distinguished success. He spoke also of the essential necessity of progression, and passed on to notice the two classes of students—those whose tendencies were to become painters, and those who wished to apply their knowledge to purposes of decoration. Without wishing to dishearten any of the students under his care, he would ask them to consider to what their engagements in the institution were leading. He would have them recollect that the calling of an unsuccessful painter was one of much wretchedness. Europe was absolutely inundated with bad painters. The alternative was the taking up of that department of art (the humbler department, certainly), for which many of the students were capacited—the art of applying the beautiful to the useful in the wide world of the decorative arts. The greatest geniuses in art had thought it worthy of their consideration to devote much of their time to the application of art to industry. The vast gatherings of merchandise in the various industrial exhibitions showed clearly enough how much might be done in this direction, notwithstanding the great growth of the ornamental arts during the last fourteen years. Many of the students of this institution had long made the decorative arts their exclusive study, and after a comparatively short career had, without difficulty, procured honourable appointments, and certainly much more remunerative than any engagement they could have obtained in connexion with other walks in art. Let them not forget that the Manchester School of Art possessed such machinery for the furtherance of the knowledge of ornament as no other school in the provinces had at command. Mr. Bazley distributed the prizes.

The Cork School.—The annual distribution of prizes and distinctions awarded for works executed by the students of this school, took place in the Rotundo of the Athenæum. The premiated works and many others executed in the school during the year were exhibited, and attracted great attention from the large number of persons who visited the Rotundo. The master of the school (Mr. James Brennan) read the report for the past year, from which the following is taken:—

"The numbers attending the school for 1865, when contrasted with the present year, stand as follows—102 for the summer period of 1865, against 125 this year for the same period; and 100 for the winter session, against 112 this year, so that there is an increase in the number of students attending the school this year. Amongst the successes which students of the school have obtained this year, I may mention the following. Two of our lady students, Miss Anne Baker and Mrs. Henry Hill, forwarded original paintings to the Exhibition of the Society of Female Artists, London, where the former lady was fortunate enough to dispose of one of her paintings to an English gentleman the first week of the opening. A number of drawings from the various schools of art were sent in to the International Horticultural Exhibition, for competition, and to one of our students, Mrs. Henry Hill, the second prize was awarded for drawings of orchids, London taking the first prize, and Edinburgh the third. With regard to the prizes offered by the Department, the list has been increased and improved. They offer for next year's competition ten gold medals, six of them for design, twenty silver medals, fifty bronze medals, and prizes of books in addition, perfect freedom being left to the student in the choice of subjects for competition in the various stages to which prizes attach."

IMPROVEMENT OF PRESTON HARBOUR.

PRESTON occupies a position of great business importance; but its river, the Ribble, like the Clyde of last century, is useless for vessels of any size worth speaking of. It appears, however, from a report to the Corporation, by Messrs. Bell & Miller, C.E.,* that for a sum of 110,000*l.* not only could the Ribble be effectively deepened so as to admit large vessels to the town, but from thirty to sixty acres of docks could be there secured in the vicinity of the present quays.

The report makes it quite clear that the improvement of the Ribble presents no difficulties compared with those which have already been overcome on the Clyde. Messrs. Bell & Miller point out, in the first instance, that in the Ribble (which is tidal, and seventeen miles in length from Preston to the sea) there are great facilities for forming and maintaining a comparatively straight and uniform channel of easy access. This they propose to do by deepening the river from Preston to Naze Point, and by removing a ridge or bar of marl and gravel at Bank Nook. The training walls of rubble which serve to contract the channel and guide the current terminate at present near Naze Point; but they propose that the south wall shall be carried some distance beyond Lytham Pier, where it may be said the sea channel begins. The river bed, we are assured, presents remarkable facilities for deepening, the levels are in every respect suitable, and the nature of the strata of the river bottom affords facilities for its removal, as it is composed of sand along nearly the whole of its course below Preston.

The cost of these improvements on the channel of the Ribble, the engineers estimate at 28,000*l.* If the lock of the proposed harbour be placed at Ashton quay, something like 36 acres of dock accommodation would be obtained, at a cost estimated at 74,000*l.*; but if the lock be placed at the point indicated lower down the river, a dock area of 60 acres would be obtained, at a cost of 80,000*l.*

The Ribble committee of the Corporation have had the report upon its improvement under consideration, but they have come to no resolution as yet on the subject.

Preston is an enterprising place. The inhabitants have spent large sums in the drainage and other improvements of their town, and it is only surprising that they have been so long in following such examples as those given by Glasgow and other important and thriving towns. The district of Lancashire in which Preston is situated is a very thriving and populous one, and the Ribble is quite as much fitted to be its outlet to the sea as the Clyde is of Glasgow. The advantages of such improvements as those contemplated would be immense, and it is to be hoped the people of Preston will not rest satisfied now till they be carried out.

NITRO-GLYCERINE.

AMONGST the latest batch of Acts passed during the last Session is one relating to the "Carriage and Deposit of Dangerous Goods," which is of some public importance. The frightful explosions of nitro-glycerine which have taken place abroad caused the late Government to bring in a Bill to regulate the transmission of this dangerous explosive. The Act is dated August 6th, and it provides that nitro-glycerine, or glonoine oil, shall be deemed "specially dangerous;" and also gives power to her Majesty, by an order in council, to declare any other goods to be "specially dangerous," within the meaning of

* "Report to the Mayor and Corporation of Preston upon the Improvement of the River Ribble, and the Construction of Docks and other Works, at the Port of Preston." Bell & Bain, Glasgow. 1866.

the Act. No person is to deliver any specially dangerous goods to any warehouse owner or carrier, or deposit such goods on any quay or in any warehouse or ship, for transit, without distinctly indicating the nature of the contents on the outside of the package; and at the same time giving notice in writing to the owner of the warehouse or quay, or to the carrier, stating the exact nature of the goods, and also that they are specially dangerous. The infraction of the law is punishable by forfeiture of the goods and a fine of 500*l.*, or imprisonment, with or without hard labour, for any term not exceeding two years. Section 6 provides that no warehouse owner or carrier shall be bound to receive or carry any goods which are specially dangerous. With regard to the storage of nitro-glycerine, the 8th section provides that the "Act for the Safe Keeping of Petroleum" (25 and 26 Vic., c. 66) shall extend to nitro-glycerine, and shall have effect as if nitro-glycerine had been mentioned in addition to petroleum; with this difference, that the part of the Act which specifies the maximum quantity of petroleum to be kept without a licence shall not apply in the case of nitro-glycerine, "and any quantity whatever of nitro-glycerine shall be deemed to be subject to the provisions of the said Act." The same rule is also to apply to any other substances which shall hereafter be declared "specially dangerous" by an order in council. The Act will probably have the effect of entirely stopping the trade in nitro-glycerine in this country until its use has become a little more familiar.

A report on the dangerous nature of nitro-glycerine was presented to the underwriters by Captain Grant, one of the officers of Lloyd's Salvage Association, who placed himself in communication with Professor Abel, of the Royal Arsenal Laboratory, Woolwich. Appended to the report is a copy of a circular issued by the Prussian Government respecting the transport of nitro-glycerine. It is to be packed in bottles made either of tin or strong glass, which must be closed by a stopper of cork, not of glass, and they must be cased with cork, and have an inside lining of straw. As a further precaution, the bottles are to be packed with hay, straw, or the like, in tight wooden cases, and the packages are to be marked *Sprengoel* (blasting oil). Particular care is to be exercised in the transit of nitro-glycerine during cold weather, as it freezes into a solid mass at low temperatures, and is then, it is said, peculiarly liable to explode by concussion. As regards the warehousing of blasting oil, the same orders have to be complied with as those applying to gunpowder and other explosive articles. The penalty for an infraction of these rules is not to exceed ten dollars (about 30s.), so that it will most likely be found cheaper to disregard the regulations, and, if detected, pay the fine. In the United States, the laws affecting the transport of this substance are very stringent. It must not be conveyed in any vessel or carriage carrying passengers, under a penalty of 5,000 dollars. In case of death from a violation of the law, the parties are liable to be indicted for murder. Nitro-glycerine is not to be transported unless packed in a metallic vessel separate from all other substances, and labelled, "Nitro-glycerine —Dangerous." Violations of this clause are to punished by a fine not exceeding 3,000 dollars.

Some interesting particulars have been communicated to the Academy of Sciences by M. Kopp, who stated that nitro-glycerine had been introduced into the sandstone quarries of Zorn, on the Lower Rhine, where it had been exclusively used for six weeks. M. Kopp is of opinion that the transport of nitro-glycerine should be entirely forbidden, and that it should be prepared on the spot; and he gives the details of the method of preparation which he thinks the best. The properties of nitro-glycerine, as given by different experimenters, appear to vary very much, scarcely any two observers agreeing on the subject. M. Kopp is a very eminent chemist and a well-known careful experimenter, and is moreover unconnected with the trade, so that his results have more value than any of which we have previously been possessed. He finds that when nitro-glycerine is exposed to the prolonged action of a moderate degree of cold, it crystallises in long needles, in which state it will explode by a sudden blow. It may now be handled easily and without much danger. When spread on the ground, it takes fire with difficulty by contact with a burning body, and only burns partially; a flask containing nitro-glycerine may be broken upon stones without explosion taking place; it may be volatilised without decomposition by a regulated heat, but if it boils, detonation becomes imminent. If a drop be let fall on a metal plate moderately heated it evaporates quietly, but if the plate be red hot, the nitro-glycerine takes fire immediately and burns like gunpowder, but noiselessly. If, however, the plate without being red hot, is hot enough to make the drop boil immediately, it decomposes suddenly with a violent explosion. M. Kopp accounts for the recent disastrous explosions by stating that nitro-glycerine, especially when impure and acid, is liable to spontaneous decomposition, accompanied by an escape of gas and the production of oxalic and glyceric acid. When the substance is enclosed in well-corked bottles, the gases cannot escape. They exercise an enormous pressure on the nitro-glycerine, and in this state the least shock and the slightest movement will cause an explosion. M. Kopp's paper is translated entire in the *Chemical News* from the original in the *Comptes Rendus* of the French Academy for the 23rd of July.

Several methods of preventing the accidental explosion of nitro-glycerine have been proposed. The inventor has suggested to dilute it with wood naphtha, which may be removed when desired by the addition of water. The naphtha mixes with the water, and the pure nitro-glycerine sinks to the bottom. There are several objections to this. It is expensive, and probably there would be some chemical action between the two liquids. Naphtha vapour, moreover, forms an explosive mixture with air. It has also been proposed to store nitro-glycerine mixed with sand, which is to act somewhat in the same way as the silicious matter used by Mr. Gale for "protecting" gunpowder. It is not very clear how the sand is to be removed when the nitro-glycerine is required for use. The most sensible proposal seems to be that put forward by Professor Seely, of New York, who appears to have given the subject a good deal of attention. It consists in exercising more care in the original preparation of the compound, and in keeping suspended in the oil a small quantity of neutralising substance, so as to destroy the acid as it is formed, and thus check the tendency to spontaneous decomposition.

The nitro-glycerine sent out from Messrs. Nobel's manufactory at Hamburgh is contained in wrought-iron bottles, about four-fifths full, and packed in iron-bound boxes, each bottle being separated from its fellow by a layer of marl, so as to avoid any chance of explosion by the accidental striking of one against the other during transit. It is stated that boxes packed in this manner have been flung about and subjected to all kinds of rough usage, with the view of testing the safety of this mode of transport. The latest novelty introduced by Messrs. Nobel is a signal-rocket, which is capable of ascending to the height of 800 to 1,000 ft., although the body is not more than 1½ in. diameter, and 2½ in. long.

TOMB OF NOVEL DESIGN.

CONSIDERABLE difficulty has been found lately in designing the tombs of the departed. The old Pagan emblems of blazing urns and extinguished torches, and even the broken column, do not point out the hopes the Christian has for the future. On the other hand, the Mediæval styles may be incongruous with the habits and the customs of the present day. What can be more ridiculous than to see, as the memorial of a late liberal member for a metropolitan borough, a portraiture in incised brass let into the pavement armed in all points like a knight of Edward III.'s reign? One is tempted to say, in the words of George Canning, "No waiter! but a Knight Templar."

The tomb of which the enclosed woodcut is a perspective view has just been erected in the Brompton Cemetery, to the memory of a gentleman many years member for an important borough in the West of England. It has been designed by Mr. Ashpitel, in the style of those of the early Christians, as found in the catacombs at Rome. The body is of Portland stone; the frieze and plinth are of green Forest of Dean, and the pilasters of polished Peterhead granite. The most novel features of all are the statues of the four Evangelists, in bronze, by Messrs. Potts, of the Art Works, at Handsworth, near Birmingham, which are cast by their new process, and are undercut and chased up by hand in a very satisfactory manner. They were modelled by Signor Brucciani. On the top is a plain cross; on one side, the monogram of Constantine; and, on the other, an interlaced Alpha and Omega. It seems curious that so little attention has been paid to the works of the early Christians. It is allowed on all hands, by all sects and parties, that the Christian religion was then in its purity; and, besides this, it was an age of great refinement. Of course we are no advocates for mere dry copyism, but we think some good aspirations might rise from the study of a style that clearly cannot be called Pagan.

ANCIENT SYNAGOGUES IN CENTRAL EUROPE.

ON first thoughts it may seem strange that the Jews have left us so very few Mediæval antiquities, but on further consideration one ceases to be astonished, as the persecutions which that ancient people endured from time to time, and their almost nomadic condition, allowed them little opportunity to pursue the fine arts, particularly architecture. The only remains of any importance in central Europe that can safely be ascribed to them are the synagogues at Worms, Prague, and Frankfort. All these buildings are small, and none of them can be quoted as first-rate specimens of the architecture of the date at which they were erected.

The earliest is the synagogue at Worms. This building consists of a nave about 50 ft. long by about 35 ft. wide, divided down the centre by two cylindrical columns, and a kind of transept or aisle built at right angles, opening into the nave by two sharp-pointed arches. The capitals of the columns of the nave are very remarkable, and show considerable elegance of design and skilful execution. Each cap is carved out of one solid block of stone; the shafts are also monolithic. These columns support a simple Roman vault, of very solid construction, but entirely devoid of ornament; and the contrast between the richly-sculptured capitals and the plain vaulting gives rather an Eastern appearance to the interior of this singular building.

The windows are mostly semicircular-headed; two of them, however, are pointed; but the splay of the head is made to take a semicircular form internally. Above some of the windows are simple round openings. The "ark," or tabernacle for keeping the sacred books, is a work of the latter part of the sixteenth century, and is in rather a barbarous Italian style; but very peculiar. In the centre of the building is what we should call the choir in a Christian church, with a stone desk; this portion of the building is raised one step above the rest of the nave, and surrounded by a low iron railing. From the roof some very fine chandeliers, of seventeenth-century work are suspended: several of them are adorned with scroll-work, and have the imperial eagle over them.

The exterior of this building is nearly as singular as the interior; one is first admitted into a court, three sides of which are occupied by buildings, and the fourth side is open to a kind of cemetery. The first side of this court consists of a sort of gatehouse, of no very early date; the next side is formed by the before-mentioned transept, which, by the way, is devoted to the use of the female portion of the congregation; a stone bench runs along this building, protected by a kind of penthouse roof. The third side is formed by a portion of the nave of the building and a small late addition called the "Raschi Chapel." The earlier portions of this synagogue are probably as early as the twelfth century. The people at Worms claim for it a much earlier date, but the peculiar style of the caps fixes the date almost beyond a doubt. It is singular that one of these caps bears a strong resemblance to one in the Church of the Nativity, at Bethlehem.

This synagogue is now being restored, and the whitewash with which it was disfigured is being scraped off. In the view, made specially for our pages, the benches are omitted, as they are quite modern, and very ugly.

The synagogue at Frankfort * is of the same general plan as that at Worms, with the exception that there is no transept or aisle. The vaulting is curious; it is arranged in an oblique form, so that a pendentive comes opposite to each arch. The date of the building may be half a century later than that of Worms.

The synagogue at Prague is exactly similar in plan to that at Frankfort; it is a building of the thirteenth century, and very pure and good

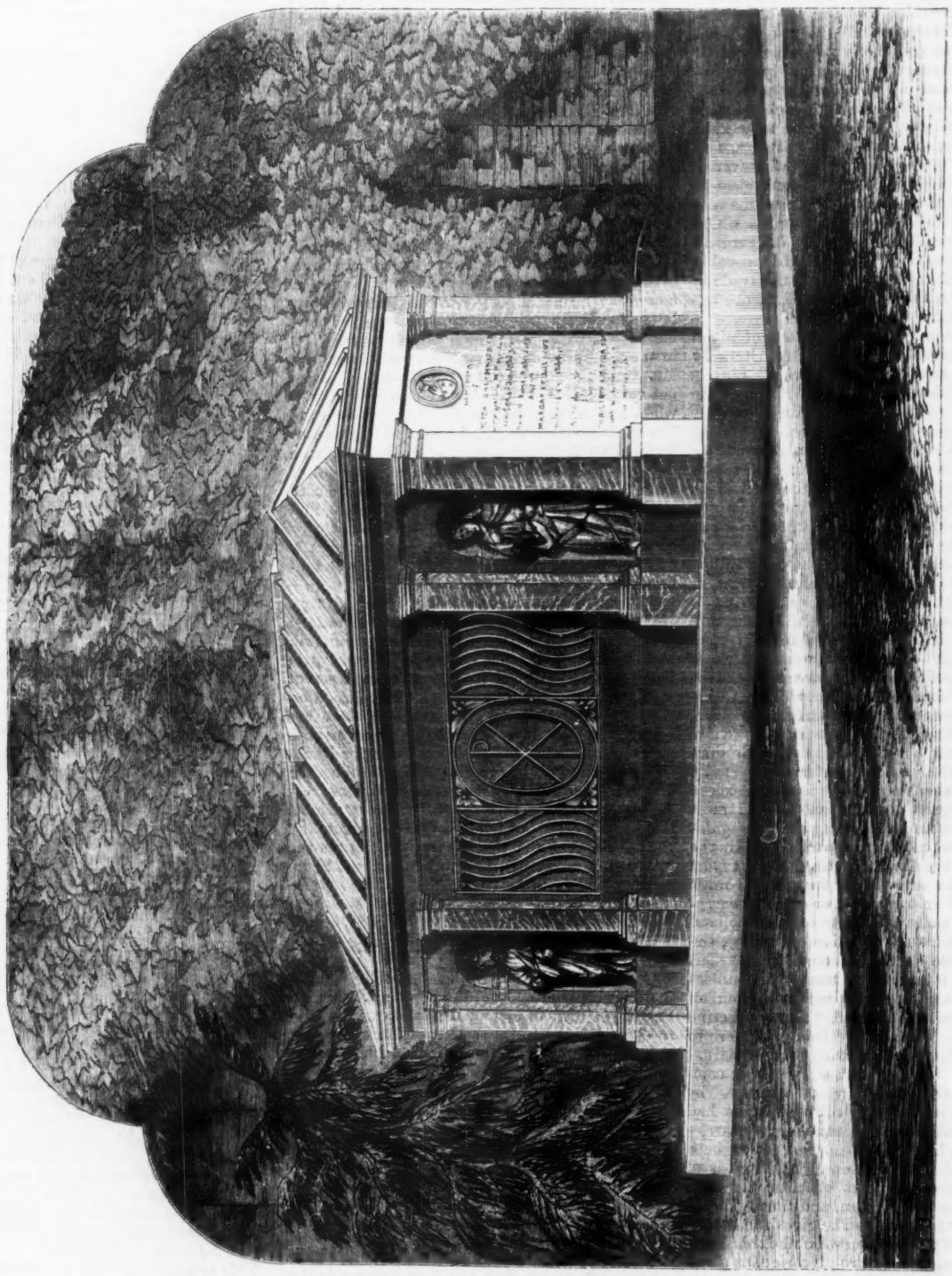
* We fear this building has been destroyed during the alterations of the last few years.

in all its details. The columns are octagonal, with capitals that form a star on plan: each ray of this supports one of the vaulting ribs, which are well moulded. The windows are simple lancets, except at the east end, which is lighted by two plate tracery quatrefoil openings, inclosed in circles. The "Ark" is very singular, and looks like a piece of Italian Gothic of the fourteenth century. It is composed of a kind of grey limestone, and has twisted columns, and a pediment adorned with regular Italian Gothic crockets. The women's gallery looks into the synagogue only by three small segmental windows.

Near this last is a very small synagogue, probably of fifteenth century work. It is simply an oblong room, with a prettily vaulted ceiling. All the windows have been modernised, and the interior was refitted during the last century. There is a large old cemetery belonging to the Jews in Prague; but although it has been used for over ten centuries we do not think that any monument at present in existence is of an earlier date than the sixteenth century. The monuments greatly resemble those in English churchyards of the last century: simply a large head-stone, with a good deal of bad "Rococo" carving over the upper part of it.

The synagogue at Ratisbon is a fifteenth century building; but we were unable to find out whether it had always been used for its present purpose.

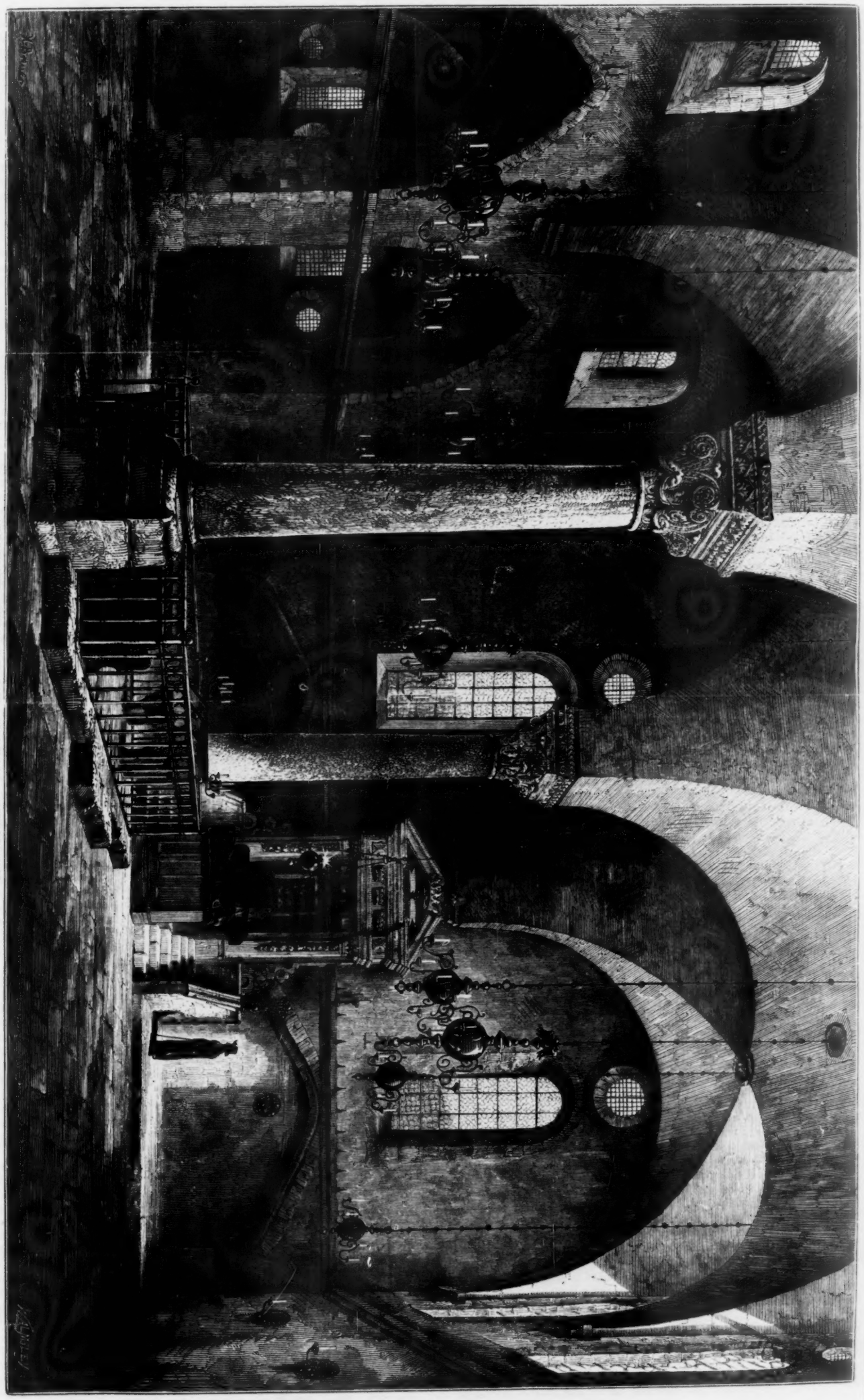
We are not aware of the existence of any



A TOMB IN BROMPTON CEMETERY.—MR. ASHPITEL, ARCHITECT.

other old synagogues in Germany; nor do we know of any in France.

Spain is said to possess one or two, but we have been unable to gain any information respecting them. In England the only building of the kind is the old borough gaol at Bury St. Edmunds, which is known originally to have been a synagogue. It is a very small Early Norman building, 36 ft. long by 27 ft. wide. At one end are two well-moulded semicircular headed windows. The interior of the building has been so much mutilated that it is quite impossible to realize its original condition. Until a recent period this building went by the name of "Moses's Hall." The fact which most strikes an observer in all these synagogues is their great similarity to Christian buildings of the same date. And one is led to wonder how it was that a people so isolated from those who surrounded them as the Jews were, should have condescended to have adopted the style of those amongst whom they lived, particularly in their religious buildings, where it might be expected that anything like "Christian architecture" would have been most scrupulously excluded; and this leads us to the conclusion that the synagogues we have described, although built for the Jews, must have been erected by Christian workmen. On the other hand, however, the similarity of plan to be observed in these buildings would seem to point to some traditional arrangement which the builders were unwilling to depart from for many centuries; and this would appear to indicate that these synagogues were, even if erected by Christian workmen, planned by the Jews themselves.



ANCIENT SYNAGOGUE, WORMS, GERMANY.

PHOTOGRAPHY.

M. NEIPCE DE SAINT-VICTOR states that the obtaining of the black tints in héliochromie is certainly more extraordinary than obtaining colours. There are four processes by which these results can be produced. The first offers most interest, because it allows pure black tints to be obtained either in the camera or by contact. These results are accomplished by the reaction of a highly alkaline liquid upon chloride of silver.

M. Silvy has sent to the Photographic Society of France some photographs obtained by the aid of the magnesium light, of the vaults of the Chapel Royal of Dreux. These vaults, without being subterranean, are excessively dark, and only receive the daylight through painted windows placed at a considerable height, and very intense in colour; so that, without artificial illumination, it was impossible to take photographs of them. The lamp he used is so arranged as to burn at the same time four ribbons of magnesium passing through two parallel tubes, and the light produced by it is exceedingly beautiful. A great portion, however, of it is lost, or rather intercepted by the part of the ribbon which, having been burned, does not detach itself fast enough, and so obstructs the brilliancy of the flame, exactly as a candle which wants snuffing. It would be very easy, however, to obviate this inconvenience if, while waiting for some better contrivance, these primitive lamps were a little improved. As, in this actual case, a great surface, that of an entire tomb, had to be lighted up, the lamp was obliged to be placed at a certain distance, and moved nearer to or farther off, according to the effect to be produced, and the time of exposure was rather long; it was never less than six or eight minutes with plates prepared with wet collodion. The lamp used was furnished by Mr. Solomon, of Red Lion-square, London. The six tombs reproduced are those of the Duchess dowager of Orleans, the Duke of Orleans, Princess Marie Duchess of Wurtemburg, the Duke of Penthièvre, Mademoiselle de Montpensier, and the Angel of Grief.

NEW CHURCHES AND RESTORATIONS ABOUT WORCESTER.

OWING to the large increase of the population in Worcester and its neighbourhood during the last few years several new churches have sprung up, and the enlarging and restoring of others is being rapidly proceeded with. The local *Chronicle* gives an account of these, from which we quote. A new edifice has been erected near the Shrub-hill Railway Station for the parish of St. Martin, which has become too populous for a single church, and another at Barbourne. Only a few months back the new Presbyterian Church, in Castle-street, was opened; and now efforts are being made to build another church in connexion with the English establishment in this, the Tything district. The site selected for this church is nearly opposite St. Oswald's-walk, in the Tything. It is intended to re-pew St. George's Church.

St. Nicholas's, Worcester, is being generally repaired and reseated. The roof, which was in a lamentable state, has been for the most part renewed. The old pews have been removed and open sittings substituted, by which means additional accommodation will be obtained. The high gallery front has been removed and replaced by an open one, in which wrought-iron work, executed by Skidmore & Co., of Coventry, has been introduced. The building will be warmed by means of Haden's hot-water apparatus. It will be lighted and ventilated by a central sunlight gas-burner. This edifice was always considered a dark and gloomy one, and it was rendered still more so by the erection of the new City and County Bank, but it will, owing to these alterations, be rendered much lighter, especially when the side windows have been re-glazed.

The rebuilding of Hallow Church is also being rapidly proceeded with by the contractors, Messrs. Inwood & Osborne, of Malvern, from plans provided by Mr. W. J. Hopkins, the diocesan architect. The site is central. The edifice will consist of a nave and chancel, north and south aisles, vestry, south chapel for the children, south porch, and a western tower. The tower is not included in the present estimate. The nave will be 42 ft. high from the floor to the collar-pieces of the roof, 60 ft. in length, and 20 ft. in breadth. It will be divided into four bays, the arches to which will be supported by circular columns, having corresponding responds. Over each of the columns and responds, and spanning the whole width of the nave, will be stone arches supporting the roof-timbers, answering the purpose of ordinary wooden principals or trusses. The thrust of these arches, and those of the corresponding ones over the aisles, will be counteracted by means of external flying buttresses. The body of the church will be lighted by means of a large five-light western tower window, having rose tracery; circular clerestory windows, having alternating patterns of tracery; and the several tracery two-light windows in the north and south aisles. The chancel will be 32 ft. in length by 18 ft. in width, having a lofty open-timbered roof. It is lighted by an east window of three lights, and north and south windows of two lights. The children's chapel is placed at the east end of the south aisle, and the south window of the chapel is rendered distinctive by being gabled. The vestry and organ-chamber are placed in a corresponding position at the end of the north aisle. The tower and broach spire will be 143 ft. high, if built. The church is of the Early Decorated style. It will be built entirely of stone, given by the Earl of Dudley, and chosen by the architect from one of the best quarries on the estate. It will be fitted up with plain open deal seats, and the pavements will be laid with red and black encaustic tiles, from the manufactory of Mr. Godwin, near Hereford. A slight polychromatic effect will be produced by the introduction of grey stone with the neighbouring red stone, in the columns, arches, and other portions of the building. Earl Beauchamp intends giving a reredos.

At St. George's, Kidderminster, an improvement has been made, by the erection of a reredos, extending the whole width of the sanctuary, and formed into three compartments, by means of three horizontal bands. In the centre, over the altar-table, is a canopied recess, surmounted by an alabaster cross, enclosing a large sculptured group, the subject of which is the Ascension, by Mr. Wm. Forsyth, of this city. The floor of the sanctuary has been raised, and laid with encaustic tiles. Several other improvements have been made in the arrangement of the east end of the church, and the walls are being decorated so as to harmonise with the new reredos.

The old Chantry Chapel at Kidderminster has been restored, by Mr. Hopkins, at the expense of the Earl of Dudley. A new open-timbered roof has been substituted for the flat modern plastered ceiling. A new floor has been laid, and the whole of the building renovated. The builder was Mr. Haigh, of Kidderminster.

CIVIL ENGINEERS AND PUPILS.

CONSIDERABLE discussion has from time to time taken place at the Mersey Dock Board relative to the restrictions placed upon the engineer of the Board (Mr. Lyster) as to taking articled pupils. Last week a proposition was made to abolish these restrictions, and letters were read from the engineer-in-chief of the London and North Western Company and other eminent engineers, stating that it was one of their privileges to take articled pupils. It was pointed out that the Mersey Dock Board Estate offered a field unequalled in the world for young aspirants to engineering skill and fame. Ultimately the proposition was adopted, the arrangement being that the engineer should be allowed to take three pupils, which it was estimated would add about 300*l.* a year to Mr. Lyster's income, which is at present 3,500*l.*

PADDINGTON.

AMONG other improvements going on in this important parish is the erection of a bridge over the canal at Westbourne-green, commonly called the Lock Bridge. The Board of Works guaranteed to subscribe the sum of 1,500*l.* The work was at once commenced. A temporary bridge, built for the traffic during the construction of the new one, was opened in September last. The work, according to the contract, was to be completed in four months; but, owing to the great obstacles that had to be contended against, and the temporary bridge being found to stand well, a further grant of time is allowed to the contractors, who are Messrs. Dixey, of Abchurch-lane, City. The cost will be 5,040*l.*, which will principally be borne by the parish, the Board of Works paying the 1,500*l.* as above named. The bridge will be constructed chiefly of iron. It is being manufactured at Birmingham, and is on its way to the works. The sides will be 6 ft. high on each side, to prevent the nuisance that was so great on the old bridge to foot-passengers, through so many idlers standing about. The new bridge will be about 30 ft. wider than the old one. The work is being carried out under the superintendence of Mr. E. H. Thomson, resident engineer, on behalf of Mr. W. Kinipple, C.E., and the Vestry of Paddington; Mr. Cook being the principal on behalf of the contractor, Mr. Dixey. Messrs. Vigers have erected large wharfs on the right of the bridge; and a new road is formed, called Ambley-road, likewise a terrace, opposite the hospital; and in the coming summer there will be upwards of 400 houses commenced on the fields across to Kilburn.

INDUSTRIAL TENEMENTS, DUBLIN.

THE first stone of the new model dwellings about to be erected in Meath-street by the "Industrial Tenements Company" was laid on the 20th instant by the Lord Mayor of Dublin.

The plan of the buildings represents a series of double dwelling-houses four stories in height, each floor affording two complete family tenements, comprising living-room, scullery, and bed-recess, with two extra bed-rooms, each communicating directly with landing, or inclosed at pleasure, with external door at entrance, the staircase being in the centre, upon each lobby of which an open gallery has been provided, having cinder-shaft on one side, and water supply with sink leading to drain on the other. The ground-floor fronting Meath-street has been appropriated for shops, the entrance and stairs to dwellings over them being in the centre, and the basement being intended for storage. The ground-floors are intended to be paved with tiles on concrete, the upper stories having boarded floors. The laundry and drying-rooms, with "closets," will be provided in the airing-ground at rear of all the buildings. It has been considered desirable to give the buildings more the appearance of a number of commodious dwelling-houses than that of a public institution, as being more suited to the tastes and habits of those for whom they are intended, affording also greater safety from contagion, fire, or other casualties. The entire buildings will afford 120 rooms, with two extensive shops and stores on basement for letting. The contract has been taken by Messrs. W. & J. Beckett for 4,365*l.*, and will be carried out with all speed under the direction of Mr. Charles Geoghegan, architect to the company.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary meeting of members was held at the House, in Conduit-street, on Friday evening (the 21st ult.), Mr. E. J. Tarver in the chair.

The following gentlemen were elected members of the Association:—Messrs. Lovejoy, Drury, Colthart, Woodcock, Winks, Capes, E. Skerritt, &c.

Mr. L. W. Ridge called attention to a class which had, he said, been established to fill the place of the Voluntary Examination Class, and the object of which was to promote the knowledge of practical subjects. The mode of study would be by question and answer; and he hoped that as many members of the Association as could spare time would attend it.

Mr. G. H. Birch then read a paper "On the Conventual and Parochial Churches of the City of London and its ancient Wards." In reviewing the history and describing the more salient points of many of these buildings, he expressed his regret that there was no conservative spirit abroad to save such historic monuments from desecration and destruction. Of the 114 churches in the City of London and the wards belonging thereto, which were in existence before the Fire of London, eighty-nine were destroyed by that great disaster. The East Minster, so called to distinguish it from West Minster, and founded by Matilda, the wife of King Stephen, was removed in order to make room for St. Katharine's Docks, which might just as well have been placed a little lower down the river. Having referred to several other churches,

of which no vestige now remains, Mr. Birch concluded by entering a protest against the proposed destruction or removal of City churches. Such relics of Old London ought, he thought, to be dear not only to the antiquary and archæologist, but also to the architect; and he hoped that no utilitarian considerations would be allowed to disturb them.

Mr. Ridge called attention to the gigantic railway station lately erected by the South-Eastern Company, in Canon-street, which, he said, completely shut out the view that used to be obtained from London Bridge of St. Paul's Cathedral, Bow Church, Christ's Church, and other buildings, and which used to form so pleasing an architectural combination. He regretted that no measures had been taken in time to prevent this, as he saw no reason why the roof should have been carried to such a height.

The Chairman suggested that it would be very desirable that the members of the Association should visit the old City churches still left.

WASTE LANDS AND WASTED RESOURCES OF IRELAND.

OF all the great questions that agitate the public mind, and which are daily growing in intensity, those relating to Ireland are the most momentous at the present crisis. It was proposed in 1852 by the party now in power, just before the ministry collapsed, to enact a law for the establishment of tenant right; in subsequent sessions various other measures of improvement were debated, such as the modification of the Church of England, and a more equitable appropriation of its revenues in that country: but no definite and pronounced plan has ever been mooted for the attainment of objects which would, beyond all others, promote the prosperity, happiness, and content of the people; and these are, first, the reclamation of waste lands; and, secondly, an extended system of education.

Seeing that one of the most fertile regions of earth, in the temperate zone, in close affinity with Great Britain, should at this epoch, with a redundant and energetic population, be cultivated in only one-fourth part of its extent; that the people, to the amount of one-third of their number, are wholly untaught and steeped in ignorance; under these circumstances, coupled with the fact that five-sixths of them differ from the established and endowed religion of the country, it can excite no surprise that disaffection should widely prevail amongst them, and that they should seek upon a remote Continent fields for cultivation and homesteads which were denied them at home.

Representing over a fourth part of the United Kingdom, the condition of Ireland is a standing reproach to the ruling authorities. Since the first invasion and subjugation of the island by Strongbow, a continued series of feudal strifes, revolts, and massacres, kept the country in a constant ferment, until Cromwell, under his lieutenancy, in 1647, established a firmer, if not a better, order of things; and from that period when, under the Act of Settlement, the greater part of lands were forfeited, a large infusion of English soldiers and settlers took possession of almost the whole extent of three out of the four provinces, locating the extruded population in the province of Connaught, vast numbers of Scottish families having previously settled in Ulster, under the reign of James I.

In the year 1672, the first recorded census returns the population as 1,320,000 souls; in 1754 it was 2,372,634; in 1792 it was 4,088,226, from which period, and subsequent to the union with Great Britain, in the year 1841 it had increased to 8,196,597. In consequence of the famine of the year 1847, caused by the disease of the potato, and the failure of that crop, a rapid decrease had set in, until the year 1861, when the census returns gave the number as 5,798,967, being a reduction, in twenty years, of 2,397,630.

Owing to the default of manufacturing enterprise and the dearth of employment in other than agricultural labour, famine effected fearful ravages; but the decrease of population was chiefly owing to emigration, which carried off to America a million and a half between the years 1851 and 1863.

The insufficiency of cultivated superficies in Ireland for a population thus redundant, and the conditions of land tenure, coupled with latent disaffection in the multitude, unable to obtain patches of ground to grow their only subsistence—the potato—lured them across the Atlantic, where, on a less fertile soil, and in a less genial climate, they at last found scope for that industry which, when encouraged by the actuality of freehold possession and an open market for labour, soon realized so much independence as enabled them to remit to Ireland in ten years as many millions sterling, and thus they attracted their relatives to share the land of their adoption.

The whole area of Ireland, very little improved by reclamation or drainage, represented originally, as it now does, in round numbers, 21,000,000 acres.

Of this superficies, according to authoritative returns of 1864, the quantity actually under tillage was 5,705,636 acres. Of this extent the quantities are as follow:—Cereal crops, 2,257,461 acres; potatoes, 1,039,282; turnips and other green crops, 436,253; flax, 301,860; meadow and clover, 1,608,124; and fallow, 32,656. Thus it appears that of the five millions and a half acres, over one million consisted of potatoes, which was the staple food for a nomade population.

As to the social condition of the multitude, a very fair inference may be drawn from the educational returns of the decade between 1851 and 1861. In the former year the total number of persons who could read and write were 1,938,685; of those who could read only, 1,203,046; and of those who could neither read nor write, 2,766,283; whereas, in 1861, the numbers ran, of those who could read and write, 2,105,958; of those who could read only, 1,022,787; and of the utterly ignorant, 1,973,382.

From these authoritative returns we perceive an apparent advance in the year 1861 over 1851, which might argue a great improvement in mental culture of the people; but, unhappily, the census returns also furnish an estimate of the number of ignorant persons who emigrated within the decade, and sets down the probable number as 458,901, who transferred at least their physical forces to a foreign allegiance.

Owing to the influx of English and Scottish farmers since the year 1820, and perhaps to an improved system of agriculture, the profitable lands of Ireland were let out in more extensive tenures; to effect which small farms were discontinued to a great extent; and proprietors generally became averse to granting small tenures or cottage-holdings; whilst hordes of families were evicted in favour of the new system: thus the extended population, unable to find work or wage, added to the miseries of the time, and to the discontent or disaffection of the masses.

In the present condition of the country there is not room and location for its population, although reduced by something over two millions? What, then, is to be done for the unsettled portion? There is a remedy; for, independent of the unprofitable wastes, there yet remain five millions of acres capable of reclamation, and of conversion into the richest pastures.

These lands or wastes are possessed in fee by great proprietors, and, if purchased by valuation, an average, perhaps, of 1*l.* sterling per acre would be an ample compensation; or if taken in perpetuity at a chief rent, then 2*s.* per acre, or 10 per cent. on the improved value or rental, would fully compensate the owners in fee, giving them a fixed income out of sterility.

These works of arterial drainage and reclamation would be, however, too extensive and too costly for private enterprise; therefore by the interposition of Government alone could such works be carried out.

Of the whole area of wastes, peat or turf bog covers 2,850,000 acres; being nearly half as much as the portion in cultivation, and one-seventh of the whole island! This desolation, consists of 1,576,000 acres of level or flat bog, superimposed upon limestone plains; and of 1,254,000 acres of mountain bog, detached amongst the various mountain and hill ranges.

That such a condition of the island must increase the humidity of its climate is but too palpable; and it is equally clear that, by drainage of these immense morasses, a more genial temperature might be secured, whilst the health of the population would be improved, and the climate rendered more equable and attractive for perennial residence. Many parts of Lincolnshire and Yorkshire fens thus treated are wholly changed in character; and from having been agueish and unhealthy, have become agreeable and populous. If this, then, be so upon a small scale, how much the greater must be the efficacy when extended throughout the entire surface of a land not now considered unhealthy—the worst characteristic whereof is its constant rainfall and humidity.

As this drainage and reclamation would desiccate and improve the climate, so it would also yield ample returns for the outlay; producing live stock for the English markets, and bestowing greater aptitude for cereal crops upon the now existing tillages, which, owing to the humidity of the atmosphere, grow but a very small proportion of wheat.

By a maximum outlay of 5*l.* per acre, including the purchase of proprietary rights, the most fertile pastures might be formed upon an extensive scale, the annual rental whereof may be estimated on an average of 10*s.* per acre; for at such a rental small holders would regard such leases as independent possessions.

Such a system could be undertaken by Governmental authority only; for no company, and therefore no individual landowner, could do it.

So long back as 1675, Sir Wm. Petty, a great authority in his day, who was Surveyor-General under the Commonwealth, Charles II. and James II., and by whom the celebrated Down Survey was completed, drew out a treatise, with this unpretending title,—"The Elements of Ireland, and of its Religion and Policy, by Sir William Petty, Fellow of y^e^ Royal Society, 1687."

The drift and chief object of it was to convert the whole extent of Ireland into a stock farm; to withdraw a million of the inhabitants to England, leaving only 300,000—one half herdsmen, and the other 150,000, dairy-women!

The dedication to the king, being terse, is given as written, viz.:—

> "To the King's most excellent Majesty.
>
> When I find out puzling and perplexed matters that may be brought to tearms of number, weight, and measure, and consequently may be made demonstrable; and when I find things of vast and general concernment, which may be discussed in a few words, I willingly engage upon such undertakings, especially when they tend to your Majesty's glory and greatness, and the happiness of your people, being one of them myself, and
>
> Your Majesty's most humble,
> Faithful, and obed^t^ Servant,
> WM. PEITY."

After this dedication, follows a brief metrical Latin heading, selected discursively from Virgil, and not inaptly strung together.

From these short introductory specimens of the MS. essay, no one could imagine what the author was about to reveal, although he admits that he delighted "in political pastimes and paradoxes;" but the secret is fully communicated to his readers, in the following language:—

> "Some have imagined, there being about 1,300,000 people in Ireland, that to bring 1,000,000 of them into England, and to leave the other 300,000 for herds-men and dairy-women behind, and to quitt all other trades in Ireland but that of cattle only, would effect the settlement, improvement, and union above propounded; but against this method there lies this gross and obvious objection, viz., that the transporting of a million of people will cost a million of pounds; that the housing and other goods in Ireland which will be lost thereby are worth two millions more; nor is it safe to estimate other damages and expenses consequent on this undertaking, at less than one million more, in all at 4,000,000*l.* of expense and damage.
>
> To which objection there is a gross answer, which is, that by bringing 1,000,000 people into England, where are 7 already, the King's Revenue of Customs, Excise, and Hearths, will rise from 7 to 8, that is, to two hundred thousand pounds per annum, which increase, at 20 years' purchase, is above 4,000,000*l.*, and more than the loss above mentioned. Now, when the King's Revenue shall naturally and spontaneously increase, it is rationally to be supposed that the people's wealth may increase 20 times as much, the Public Revenue being, almost by a law of nature, $\frac{1}{20}$ part of the people's expense.
>
> Wherefore, suspending any further answer to the said gross objection, we proceed to say, That the transplantation, and new cattle trade above propounded, will produce the effects hereafter mentioned."

Without quoting *in extenso* from the MS., these effects, as predicted by the theorist, may be summed up in the complete tranquillization of the country, the reclamation of its wastes, and their utilization for the sustenance of the whole kingdom.

How much more would such a national undertaking, as I have outlined, benefit the State under existing circumstances: it would give employment and wages to the whole industrial people; but, further, it would give them locations, homes, pastures and gardens, and stop the exodus before the land is depopulated, turning their disaffection to quietude, if not loyalty.

The temper of the time is manifestly to make just concessions to the demand, and necessities of the Irish people; the educational question, equalization of the churches, land tenure or tenant right, and others,—all these would fall like manna upon the land, if the great reclamation scheme were at once set on foot; but without that, the bestowal of civil and religious privileges is utopian. A man must be located and

housed, and thus personated, before he can be identified as a free subject: education will then follow. The sons and daughters of the soil leave Ireland, not because they love America the more, but because they have no employment, no home, and, consequently, no protection in their native land.

It cannot be denied that there has been, within twenty years last past, an obvious improvement in the condition of the people; but still the range of pasture land is increased, whilst the area for tillage and cereal crops is being progressively reduced, and at the same time land tenures under five acres are merging fast into larger farms: thus the food of the people becomes more stinted, and their cottages and homes are razed, driving them of necessity to seek new homes and occupations; for if in Ireland, there is no manufacture or industrial labour, they are forced to seek it abroad.

There are good landlords who deplore this, and who, being resident on their estates, address themselves to the physical and moral improvement of the country; but for the wide tracts held by absentee proprietors there can be little hope, unless a new field be opened under Governmental auspices. In other countries, and notably in France, national funds are applied for national improvement; the waste lands of Ireland offer an inviting field, and a sure return for such an expenditure. T. H. HARDINGE.

ARCHITECTS' AND ENGINEERS' ASSISTANTS' BENEVOLENT SOCIETY.

SIR,—In your paper of the 15th ult., one who signs himself "Assistant" wants to know why we should not have a Benevolent Institution. If this is the desire of more gentlemen than this one let them come forward and say so.

After the revelations which there were in the same week's paper concerning references, I think it is most necessary that there should be some institution where poor referenceless fellows can get relief; but I do not believe that architects' assistants should depend upon the references of an employer, but that they should all enter their profession in a right and honest manner. They should go as students of the Royal Academy, or of the Institute, and try for some travelling studentship, and take honours, which will show they are real architects. There is a scholarship offered by the Royal Academy, for which I understand there has been no competition for the last two or three years; and I think that this is shameful, and should like to know more about it. If young men would take the proper means for their education they would be able to get certificates from other sources, which would enable them to snap their fingers at their late employers. For other professions a man is obliged to show special requirements. Even in a trade a man cannot get on unless he has given his whole attention to it; but it appears to be growing more apparent every day that any man that likes can, may, and does call himself an architect. This greatest of all professions is in great danger; let us join together and try to save it.

As to the Benevolent Institution, I believe it would be very useful to us. I think we ought to be able to start such a society even without the aid of our friends the architects and engineers; but I am sure they would give us all the aid in their power. And finally that, if you will be so kind as to receive names, those gentlemen interested and willing to work can send theirs to you; and, perhaps, an assistant who has some spare time may be inclined to take the leadership in this matter. J. W. A.

A PROPER BUILDING FOR ARCHITECTS.

SIR,—Are there no Pugins left? Has his "green enthusiasm" died quite out? Is there not one architect left who will raise his voice against this money-mad generation of architects? Not one true, real enthusiastic artist in our ranks?

If such were the case, we should be most miserable; but, I believe,—though much depravity has crept in—there are among us men of whom we ought to be proud; men who are working hard because they love art, and wish to elevate their fellows. Should we give up all love for art, and turn our whole attention to money-grubbing, that day would be one of the most miserable days on record for us and all England. Oh! may the rising generation of architects keep alive their "green enthusiasm!" and may "the chill winds and damp fogs of winter" pass over it without taking the freshness off one leaf! [Amen, say we.]

Let us remember that, though we can do but little towards the elevation of the present generation of architects, the formation of the rising generation lies in our power; and that upon the way in which we each perform our part depends the honour or disgrace of English architecture. Foreign countries have been allowed to get sufficiently ahead of us. Let us each determine that we will do all we can to prevent their further ascendency.

Can nothing be done to persuade the Museum authorities to build an iron building now, as was done at South Kensington; and wait until subscriptions can be got in, or a company formed, to build an Architectural House? I hope we are not so infected by the current love of money that the latter part of "Scripsit's" letter is what we practically believe.

We have seen enough disaster and disgrace caused by making haste to get rich; if there are any artists who have joined in this rush, let them now turn their backs on their late folly, and begin a new year with an effort to show the world that they love art more than money, and, therefore, will have a proper building for architects.

ADELPHI.

DESIGNS FOR THE NATIONAL GALLERY.

THE competition designs have been sent in, and are about to be hung in the Royal Gallery at the Houses of Parliament. They will be open to the public on Wednesday, the 9th.

The following letter bears on this subject:—

"As my name has usually appeared in the list of those invited to compete for the New National Gallery, I think it right to state that I have found myself obliged to retire from the competition, owing to the claims upon my time of the concurrent competition for the New Law Courts.

GEORGE GILBERT SCOTT."

GETTING DAYLIGHT INTO ROOMS.

IT was by no means intended to suggest as a substitute for Sir David Brewster's arrangement, or for the "Patent Daylight Reflectors," a hood projecting with only a slight fall or slope. This would doubtless be open to most of his seven objections, or even to all of them if the ground side were upward. It was only mentioned to enable a reader to follow better the reasoning that leads to what I ultimately suggested as most practicable in London, a hood falling at a steep inclination, in no case less than 60°. This would not project sufficiently to affect the windows of a lower story more than cornices or eaves usually do already, nor nearly so much as our shallowest balconies or railed window-sills, or as the Patent Reflectors must, if ever used elsewhere than on the ground floor. I assumed that no practical builder would ever turn the ground side of the glass outward. If he did, the fourth objection would apply just as much to the vertical window as to my plan; and the turning it inward—as we always must, from the rain and dirt—actually involves, in the vertical window, a very slight sacrifice of light—not, indeed, worth considering; while in my plan it is optically quite indifferent which way it is turned. The outside being smooth and inclined at least more than 60°, would be no more liable to the third or fifth objections than a vertical window (to which snow will stick at times, and from the upper sheltered parts of which the rain cannot remove the dust). The sixth and seventh advantages are simply and very properly forbidden us in our chief cities by Building Acts, which require all our wood to be kept back behind a clear 4½ in. of brickwork.

Otherwise, or where no such regulations are in force, the easiest way of applying this principle would be, I think, in common domestic sash windows, to omit the bars of the upper or outer sash, and carry out its sides and top in the manner of a box, so as to receive ground glass retained by a thin metal rim quite flush with the outer wall. This glass need not extend so low as to the meeting bar, for the bottom of our box is best made to slope inward at an angle of more than 45°; and if this and the sides and top be then all lined with reflecting material,—say tinfoil protected by varnish,—as well as the fixed soffite and linings, we have the upper half of the window completely assimilated to the philosopher's ideal; and the lower is comparatively of no importance. E. L. GARBETT.

HOMES FOR THE MIDDLE CLASSES.

SIR,—Much is now done for the benefit of the working classes. Has any one thought of the great need existing among the middle classes of small means, yet compelled by their vocations to live in London, and of the difficulty, nay, impossibility of finding moderately-rented houses in respectable situations? The only alternative for families thus situated is to brave the miseries of unfurnished apartments, fully to appreciate which, they must, perhaps, have been experienced. The many discomforts need not here be enumerated; many of your readers will, doubtless, endorse my statement. Why does not some enterprising capitalist come forward, and construct buildings, to be let out, something on the plan of the Edinburgh "flats," but with the modern improvements of the "model lodging-house," or "Familistère" of M. Godin-Lemaire, at Guise? Rents of from 30*l.* or 40*l.* to 50*l.* or 60*l.*, according to the number of rooms, &c., might adapt the "flats" to various pockets, and at the same time offer a good investment to the builder. These "flats" being entirely shut in, would offer the comforts of home, which can exist only in name in an ordinary house inhabited by more than one family; and where each one is subjected to more or less interference, to espionage, and to causes of irritation more than enough to destroy the realisation of that popular fallacy of every Englishman's house being his castle. If my suggestion were adopted, families of small means would also be spared another source of constant torment,—I mean by the mistress being obviously more independent of "servant-galism." To combine economy and comfort, it would be an additional recommendation were a restaurant, baths, and even a laundry included in the building. In my own small circle many are ardently wishing for a movement in this direction; and practical people are of opinion that as in the case of the "model lodging-house," hundreds would rush to secure a chance of homes such as I have endeavoured to describe. W. A.

ARCHITECTURAL MEMS.

1. EVERY country develops by degrees its own literature, art, and architecture.

2. Architecture in its earliest stages is constructive; decorative character follows in later ages; perfection, therefore, is not in one age.

3. Architecture in early ages, though constructive, is often barbarous and crude in its decorative forms. Savages construct well, but decorate rudely.

4. When a country has developed its characteristics there is no further necessity for the introduction of foreign traits. English architecture was the result of climate, material, and race—a combination of Celtic, Norman, and Saxon elements—Aryan; but we have no necessity now of new Aryan traits from hot climates like India or South of France.

5. The development of English architecture has been continuous: every successive age has given us something new,—fourteenth century, exquisite tracery forms; fifteenth century, magnificent east windows; Elizabethan and Jacobean, admirable mansions, excellent farm-houses, half-timbered, weather-tiled, mullioned according to county and material; Queen Anne, town brick houses, with the most practical of all forms of window, viz., the segmental arch and white sash frame; Elizabethan and Jacobean ornament, most lovely from the certain classic element in it.

6. Old English gardens, with terraces, straight walks, clipped hedges, and fishponds, had *design*, which the modern imitation of nature called landscape gardening has not.

7. All old work from 1000 to 1800 was good, and should be kept, historical; if a building is of various dates, keep each part in order accordingly.

8. Art education should lead to an appreciation of northern picturesqueness, high roofs, &c., as well as to the refined proportions of southern classic façades—each in its climate. W. S.

ROYAL ACADEMY STUDENTS.

SIR,—May I ask you to give publicity to the following, as I think it is of some public importance—certainly to art students and those who now do the work of our art capitalists and employers of art labour.

President Sir Francis Grant the other evening, at the distribution of the Academy medals, expressed himself so unlike a regular and orthodox President, and so kindly as regards the Academy students, that I have felt encouraged to ask him to bring before the Council of the Royal Academy a very long standing grievance; one, indeed, dating from the very foundation of the Royal Academy. You know that any artist fortunate enough to obtain an entrance into the Academy as a student, is, or rather was, admitted for a term only of *ten* years; it has since been reduced to *seven*. After that term has expired studentship ceases, and all the helps and aids which the Academy can so well and easily give are withheld; and the student is no longer such, and the Academy doors are finally closed to him. Why this should be so it would be difficult to understand, as no art student can possibly finish his art education in so short a time as *seven* years, or even in twice that number of years. I must ask you to bear in mind, too, that the ranks of the Academicians and associates are mainly, nearly wholly, made up from the ranks of the student class, *i.e.*, the Royal Academy would cease to exist were the student class to become extinct. Suppose,

therefore, at fifteen, a student enters the Academy; at twenty-two he ceases to exist in the Academy sense, but it may be at thirty or forty he may be thought worthy of the Associateship: so that through the most valuable years of his art-labour life, he is deprived of all help and aid from that institution which was expressly formed for his instruction and help. The library is closed when he most needs it; the antique is shut up from his view; the life-school is dead to him; and the lectures he can never listen to, though the lecture-room hold empty benches in abundance. Why is all this, and who is benefited by it? I have many times been in the library all day *solus*. Of what use is an institution, if those who need it, and might use it, are excluded from it?

The Academy is to be reformed, we are told, and an unlimited number of associates are to be added to its ranks. I hope they will be compelled to furnish specimens of their personal art-power—not clerks and students' work, *but their own*. If then the associates are thus thought of, why not the students, who need it more? I have, therefore, respectfully asked the President of the Royal Academy to take into his kindly consideration the following:—

First, that a student once fully admitted into the Royal Academy, should be a student for life, unless he becomes an associate, that he may at least have the privilege of further study within the Academy walls.

Secondly, that his name as a student should be *printed*, and appear in the list of the members of the Academy, of which he *may* form in the future,—and *must*, in some cases,—a distinguished member.

I will add but one word more. At the Academy dinner, which would you rather boast of, as president, the fact of there being 1,000 students of a great Academy, the select art-energy of the time and country, or only fifty? C. B. A.

LECTURE ON FORCE.

AN able lecture was recently delivered by Dr. Monckton, in connexion with the Literary and Mechanics' Institute at Maidstone, on "The various Forms of Force; or, Niagara the Coal Mine of the Future." The lecture was illustrated by some brilliant experiments. In commencing, Dr. Monckton said that it had long been considered by philosophers that matter, out of which natural objects are evolved, is one single thing, indivisible and unchangeable. That it was quite understood to consist of but one elementary form—a molecule or minute atom—out of which every ponderable body was manufactured, from the light gas to the ponderous metal. This foreshadowed the fact that various forms of force had something to do with each other. The lecturer then entered *seriatim* into a detailed and experimental illustration of this thesis. It was the convertibility of one force into another, and the fact that if you possessed a sufficient command of one form, others could be extracted from it, that was present to his mind, he remarked, when he spoke of the Falls of Niagara being the coal-mine of the future. It would be perfectly possible to heat and light Buckingham Palace by the agency of that great cataract; it being only necessary to convert the force of the fall into motion by wheels or turbines; that into electricity by friction; conduct this current to England by the present Atlantic cable or other wires; reproduce heat in a coil, and distribute the same by hot-water pipes or other apparatus throughout the building. Of course he was expressing no opinion as to the exhaustibility of coal, and feeling no desire to suggest, that these substitutions were at present practicable in daily life; but the principle was sound now, and the application possible hereafter. The fountain whence our supply of all these forces [attractive as well as repulsive?] was derived existed in the sun. [?] This great luminary was incessantly flooding space with waves of force-motion, that is, in the shape of ethereal undulations. It was not strictly correct to say that the sun gave off light and heat; for halfway between us and him no light and heat existed, all was pitchy darkness and eternal frost; he gave off motion, which traversed space inoperative, and only became developed into light, heat, and chemical tension, when it was received into, and transmitted by, material bodies; just as the motion of the clapper of a bell under an exhausted receiver is not converted into sound so long as the bell swings *in vacuo*. But if we received this motional energy from the sun, whence does he himself derive it? In all probability, from motion too. The meteoric theory affords the most plausible explanation of the continuous renovation of the sun's expended energy. A few weeks since the air was alive with meteors; the earth had been traversing, in its orbit, the long end of the oval plane of small planetary masses which constituted the Zodiacal light: there was every reason to believe that space was filled with planetary matter sufficient, by its constant impingement with great and violent velocity on the sun's body, to extricate an amount of heat, or *converted motion*, fully equivalent to his yearly emission. At the close of his lecture, Dr. Monckton said he would venture to suggest, and as he believed for the first time, that the ignition of meteorites was partly due to the arrest of their motion, brought about by the attraction of the earth's mass. It was certain that if a meteoric body travelling forty miles per second in free space was reduced suddenly to a rate of twenty miles by the earth's attraction, violent heat would be evolved, unless the reciprocal gravitation of the meteor should itself replace the motion lost, as an equivalent form of force: and on that point, without further reflection, he would not decide.

TRADE BOOKS.

A NEW edition, issued by Messrs. Maw & Co., of their Pattern Book, deserves a few words of commendation. They have evidently endeavoured to make it as comprehensive as possible, giving a fair selection of examples of the various branches of their manufactures, and have spared no expense in the fine-art part of the work, or its engraving. The Messrs. Leighton, too, have done justice to the designs by Messrs. Digby Wyatt, Street, Seddon, Burges, Garling, Goldie, and Owen Jones. The designs and engraving have cost, we are told, over 1,400*l*., independently of the cost of the printing. The price book accompanying it (a very important adjunct), is arranged with special regard to easy reference. Every pattern is consecutively numbered, and a price is given in the list of every individual tile or design, saving the necessity of classification of the different descriptions of manufacture, which very few people understand: they have also kept to a single series of figures throughout the list, the paramount advantage of which few bookmakers and catalogue compilers sufficiently appreciate. We take the opportunity to remark that tile-makers generally would do well to make better arrangements for London customers than at present exist. Without special reference to Messrs. A. or Messrs. B., we must complain (on the part of many) of the great difficulty with which anything at all out of the common way can be obtained, and the time that is required even when the thing needed is not out of the common way. We could tell some funny stories on the subject, but this hint may perhaps suffice.——Messrs. Peard & Jackson's new book, "Examples of Metal-work," contains a large number of good (Mediæval) designs for brattishing, vanes, lamps, grilles, gas-standards, desks, and so on, with accompanying price-list to each page. The whole of the examples were drawn,—and very well drawn, too,—by Mr. W. G. Smith. ——"How to Make and Fix Paper Texts or Emblems, to Decorate Churches or Rooms" (Beal, St. Paul's-churchyard), will be found useful to the considerable number of ladies and others who now take interest in such matters.

THE INSTITUTION OF CIVIL ENGINEERS.

THE report read on the 18th ult., Mr. C. H. Gregory, V.P., in the chair, referred to a memorial recently received from a number of engineering pupils and assistant engineers, soliciting the sanction and patronage of the Institution in favour of a Junior Engineering Society, proposed to be established with the avowed purpose of mutual self-improvement in professional knowledge, and more particularly in that scientific knowledge of theory, which was becoming more and more essential to the success of the young engineer. The council informed a deputation of the memorialists, that they would endeavour to devise a plan for the consideration of the members of the Institution generally, which should substantially meet the wishes of the memorialists; but that they could not support the proposal for a subsidiary and self-governed society. The members were reminded that, under the will of the late Mr. Joseph Miller, C.E., a sum of 3,000*l*. had been left in trust, to be applied in awarding premiums or prizes to the students of the Institution.

In order to show the progress of the Institution during the latter half of its existence, extending over a period of twenty-four years and a half, or from June 30, 1842, to November 30, 1866, two tables had been compiled, from which it appeared, that at the former date the total number of members of all classes was 525, as against 1,339 at the 30th November last, showing an actual increase of 814, or 155·2 per cent. The annual increase per cent. during the past six years had been 1·61, 5·84, 4·00, 5·29, 9·86, and 11·39 respectively. During the same period, the honorary members have been relatively diminished from 6·6 to 1·5 per cent., and the graduates from 12·9 to 0·5 per cent.; while the number of members had been increased from 34·5 to 40·4 per cent., and of associates from 45·9 to 57·6 per cent. Or, in other words, taking the honorary members and the graduates together, they had, at the first date referred to, amounted to nearly one-fifth of the whole number of members, whereas at the present time they only constituted the one-fiftieth part of that number. Nearly one-half of the members and associates were resident in London and its vicinity, one-third in other parts of the United Kingdom, and the remainder in British possessions abroad and in foreign countries.

An analysis of the statement of receipts and expenditure for the year ending the 30th of November, 1866, showed that there had been received, including in each case dividends on investments, 4,945*l*. on the general account, 99*l*. in respect of the building fund, and 360*l*. on trust funds, making together 6,299*l*. The expenditure had been 4,153*l*. on the general account, and 131*l*. for premiums under trust, while 2,971*l*. had been invested, on different accounts, in Consols, and in debenture stocks of the Great Northern, the North-Eastern, and the London and North-Western Railway Companies. This showed an excess of disbursements over receipts of 956*l*., by which amount the available balance at the bankers' had been reduced. The nominal value of the different funds now belonging to the corporation together, amounted to 26,709*l*. 11s. 2d. as against 24,893*l*. 1s. 6d. at the date of the last report.

CHURCH-BUILDING NEWS.

Ashby Parva (*Lutterworth*).—We are requested to state that Messrs. Law & Son were the builders employed in restoring the church here, and Mr. Jas. P. St. Aubyn the architect.

Ipswich.—St. Stephen's Church, Ipswich, has been re-opened for divine service, having been for some months in the builder's hands. Alterations have been effected, which give the interior a lighter appearance, and increase the number of sittings. The old pews in the nave and south aisle have been replaced with open benches of white pine, stained and polished. The gallery at the west end has been taken down, giving a clear view internally from west to east. A new window has been inserted in the tower. The chancel roof has been renovated. The columns of the arches have been cleaned, and prove to be Purbeck marble, and, like those in the Temple Church, have never been polished. The number of sittings is somewhat more than before, notwithstanding the removal of the west gallery. The church is heated by hot water pipes, arranged by Messrs. Turner. The gas-fittings were supplied by Messrs. Archer & Gross; and the organ was put into the hands of Messrs. Godball. The contract has been carried out by Mr. Godbolt, of Harleston, from the plans of Mr. F. Barnes, architect, the cost being about 450*l*.

Gloucester.—Two new designs for the church for St. Catherine having been obtained, Mr. Gambier Parry was requested to select one, which he did, and which turned out to be that sent in by Messrs. Medland & Maberly, who were requested to prepare the necessary working plans and specifications, that tenders might be advertised for and a faculty applied for should the cost not exceed the estimate of the architects. The internal width of the church will be 28 ft., length of the nave to the chancel arch, 68 ft., depth of the chancel, 24 ft., width, 22 ft., and transepts, 13 ft. The pulpit will be on the north side, against the chancel arch, and the reading-desk on the south side. At the north-west corner there will be a porch, 8 ft. by 9 ft. Ornamental bands of red and white bricks will be carried along the walls within and without. There will also be a bell-turret 20 ft. high.

Clay Coton.—The church here has been re-opened. The old church of St. Andrew, Clay Coton, consisted of a nave, chancel, and a low tower, and was, previous to its restoration, in an exceedingly dilapidated condition; indeed it was found literally impossible to restore the nave. The church was built in the Decorated style of architecture, and this style has been adhered to in the re-building of the nave, the shape being a simple parallelogram, which has been preserved in the restoration. There are

three windows on the south side and two on the north, and there is also a Decorated porch on the south side. The chancel has been restored, a new vestry having been added on the north side, whilst a new Decorated window has been inserted at the east end, the glass being simple cathedral glass, with a greenish tint. The old church seats, some of which were quaint in character, have been refixed, and several deal seats have been added at the west end. The tiling for the chancel is not yet down, but the design is being executed by Messrs. Maw & Co., of Broseley. The walls of the chancel before the restoration inclined outwards considerably, but now they are kept in position by two buttresses on the south side, and the vestry on the north. The old roof of the chancel has been restored. The roof of the nave is quite open, and has six pairs of principals, with carved moulded ribs supported on stone moulded corbels. They have embattled cornices, and are all stained and varnished. Almost all the stone used in the restoration was that which formed the old church. The architects of the restoration were Messrs. E. F. Law & Sons, of Northampton, and the contractor Mr. John Gee, of Daventry.

Altrincham.—St. John's church has been consecrated. The site of the new church is the plot of land between the east end of St. Margaret's schools and Ashley-road, not far from Bowdon station. It is close to the large and rapidly-increasing population of New Town. The architect is Mr. J. Medland Taylor, of Manchester; and the contractor Mr. Joseph Thompson, of the same city. Accommodation is provided for about 950 persons, all of whom, except a few in a small gallery over the western porch, will be seated on the ground-floor. The plan consists of a broad nave of five bays, with north and south aisles, and north and south transepts. There is a large western porch; and adjoining it, on the north side, is the baptistery, which is marked off from the north aisle by a small triple arcade. On the south of the porch is the steeple. The chancel is of large dimensions and terminates apsidally to the east. The chancel aisles open by arches into the chancel and transepts, and these arches are filled to the height of about 7 ft. with arcaded wooden screens. The style is Early Decorated. The material is stone, of three or four kinds for the outside, and for the pillars and other similar features inside. The steeple rises to a height of upwards of 140 ft. The three apse windows are filled with coloured glass in grisaille patterns, by Lavers & Barraud. The vestry and baptistery windows are filled with similar glass, and have also, as part of the pattern, Scriptural inscriptions suitable for the respective places. The heating apparatus is Haden's. The builder's contract was 5,330*l.*

Sydenham.—Holy Trinity Church, Sydenham Park, has been consecrated by Bishop Anderson, recently of Rupert's Land, North America. The church is situated in Sydenham Park, near the road leading from the railway on the side of the sharp ascent, to which it stands at right angles. The ground on which it is built was given by Mr. Robert Harrild, of Round-hill, who subscribed liberally in addition. The exterior presents no particular pretension to any architectural display, and a tower is wanting. The principal entrance is at the west end. The roof is lofty, and the ceiling of stained wood with borderings. There are no galleries. On either side of the middle aisle are stone columns, fluted and capped. The seats are all open, and the edifice, we understand, will contain a congregation of 1,200 persons. Pendent from the roof are gas chandeliers, of a temporary character. The floor is composed of encaustic bricks, and the reading-desk and pulpit are east and west of the chancel. There is no reredos, and at present the communion-rails are not constructed. Between the pulpit and the vestry is the organ chamber, which contains an instrument erected by Messrs. Hill & Son. There is but one stained window at present in the church, which is placed in the west side of the chancel.

Shepperton.—St. John's mission chapel, which has just been erected here, has been opened for divine service, by licence from the Bishop of London. The chapel is a plain brick building, 50 ft. long by 20 ft. broad. It has an apsidal termination at the east end, with a small bell turret at the west. The door is on the north, and a small vestry on the south side. The site has been given by Mr. John Walter Lea, of the Grange, Shepperton-green, the rector's son-in-law. The architect, Mr. R. P. Pullan, of London, had intended that there should be an entrance porch, but owing to want of funds this has not been erected. The builder was Mr. R. G. Hopley, of Shepperton-green. The contracted price for the building itself was 355*l.*, which has been raised by subscription, with the exception of 50*l.*, which was granted by the committee of the Church Association for the United Deaneries of Hampton and Staines.

Gloucester.—The plans of Messrs. Medland & Maberly have been accepted for the church to be built on the site of the old church of St. Catherine. The building will consist of nave, two transepts, and aspidal chancel. The internal width will be 28 ft., the length of nave 68 ft. The material used will be brick, of which there will be ornamental bands.

Bristol.—Emmanuel Church, which is being erected in College-road, is designed for the use of the district severed from Christ Church, Clifton; but the completion of the main building, as well as the addition of a tower, being at present delayed for want of funds, the consecration has been postponed, and the body of the building has been opened for divine service.

Birkenhead.—The foundation-stone of a new church in Cathcart-street, Park-road, has been laid by Lord Grosvenor. The new church is intended to supply the wants of a section of the large parish of Holy Trinity, which has a population of 22,000, and has hitherto had only one church; and is to provide accommodation for 700, and to cost 2,400*l.* The site will cost 875*l.*, and it is also proposed to raise an endowment and repairs fund of 1,450*l.* The patronage will be vested in the Bishop of Chester. All the seats in the church will be free.

DISSENTING CHURCH-BUILDING NEWS.

Exmouth (Devon).—The chief corner stone of a new Congregational Chapel has been laid here. The chapel (which stands on the site of an old building erected by Lady Glenorchy in 1777) is at the corner of the Exeter-road and Meeting-street, and consists of nave, side aisle, with tower and spire at the south-west angle, under which is the principal entrance. There are vestries arranged to be thrown into one by means of a moveable partition. The style adopted is Early Decorated, and the materials local (Borryhead) stone, in black mortar, with Bath stone dressings. The roof will be open, carried out in fir, and stained and varnished: an arcade will be formed between the nave and aisle with wood columns and diagonal struts, the spandrels being filled in with quatrefoil piercings and other devices. There will be 450 sittings, which will be open benches stained and varnished. A minister's, or chapel-keeper's house will adjoin the chapel on the south side. The contract for the chapel and house is taken by Mr. George Gibbs, of Ilfracombe, for 1,200*l.* Messrs. Habershon & Pite, of Bloomsbury-square, are the architects; and Mr. J. R. Manning is clerk of the works.

Rickmansworth.—The Wesleyan Chapel in this town, which was destroyed by fire a little more than a year ago, has been replaced by a new building, which has been opened for divine service. The chief subscriber to the building fund was Mr. McMurray, of Loadwater, a member of the Scottish Presbyterian Church. The new chapel is situated partly on the site of the old one, but covers a larger space. It is in the Early English style, and its chief external features are an octagonal tower and spire, rising to a height of 75 ft. The material of the building is brick, with Bath stone dressings. The tower is at the north-west angle, and contains a clock (with three faces), by Benson, and three bells, two of which strike the quarters, and one the hour. The clock and bells cost about 200*l.*, and are the gift of Mr. McMurray. The spire is covered with tiles relieved by green bands, and is surmounted by a weathercock. A school-room adjoins the chapel, under the same roof. Internally, the chapel measures 60 ft. long, and 30 ft. wide. The available sittings number altogether about 350. Above the communion table is a stained glass window, which is the chief feature of the interior. The window is the gift of Mr. McMurray, and was executed by Messrs. Heaton, Butler, & Bayne. It is divided into three principal compartments, and represents the crucifixion of our Lord. The cost of the window is about 70*l.* The total cost of the erection has been about 2,500*l.* Mr. Thos. Pearson, of Batchworth House, was the architect; and Messrs. C. & J. Waterman, of Watford, were the contractors. The stone work was done by Mr. Coney, of Watford; and the gas fittings were supplied by Messrs. Hart & Son of London.

Bury.—The Independent Chapel, Whiting-street, has been re-opened for Divine service, after undergoing alterations and renovation, the principal feature of which is the erection of a new Gothic front, in white brick, with Bath stone dressings, in the centre of which, above the doorway, is a traceried window of four lights, with two smaller ones on either side. The old rectangular pewing in the body of the chapel has been replaced by benches of stained deal. The windows at the side are new, and new three-light gas-burners and other fittings have been put up. The alterations have been effected under the direction of Messrs. Bacon & Bell, architects, whose designs have been carried out by Mr. Tooley, builder, and Mr. Farrow, stonemason. The open palisading in front of the chapel was wrought by Mr. Andrews, ironmonger, from the architects' design. The entire cost of the alterations is about 600*l.*

Liverpool.—A new Wesleyan Chapel, at Rock Ferry, has been opened. The edifice is dedicated to the Trinity, and situated in New Chester-road. It is in the Italian style. The front and sides are faced with red bricks, with dressings of Stourton stone. The main feature of the building consists of two square towers, surmounted by a mansard roof, and 65 ft. high from the level of the New Chester-road. In each tower there is a staircase leading to the galleries, and the space between them is connected by a colonnade, covering all the entrances to the chapel. The colonnade is approached from the road by a flight of York stone steps, as the level of the chapel floor is raised considerably above that of the road, in order to secure plenty of light and ventilation to a spacious school-room and two class-rooms underneath. The entrance to the schoolroom, which, like the chapel, is 63 ft. by 50 ft., is from the back, and two staircases leading from it communicate with the body and galleries of the chapel. The chapel has class-rooms and a minister's vestry behind the body. The body will seat 500 persons, and the gallery, which is circular, has accommodation for 350. The work has been carried out by Mr. John Hogarth, builder, of Rock Ferry, under the superintendence of Mr. Joseph Brattan, of Birkenhead, architect. The entire cost, including the price of the land, is estimated at 5,500*l.*

STAINED GLASS.

Gloucester Cathedral.—The public memorial of the Rev. H. Burrup has now been placed in the east walk of the cloisters of this cathedral, by Messrs. Hardman, of Birmingham. The subjects of the windows in the cloisters, as remarked by the local *Chronicle*, in giving an account of this memorial, are after a design which was settled some years ago by Bishop Jenne. The present window is the first of the series, and represents our first parents in the garden—Eve offering Adam the fruit, and the Angel driving both from Paradise. It consists of four main lights. The tracery lights and the lower lights are filled with decorated glass and designs, one of which is that of the Crown and the Palm.

All Saints, Cambridge.—Upon the death of Lady Affleck, the wife of the late Master of Trinity, her friends in the University seemed desirous to keep alive the memory of one loved by many and esteemed by all. The vicar of All Saints' made a proposal to them to fill the east window of her parish church, of which she laid the foundation-stone, with stained glass, as an appropriate and lasting memorial. A large sum of money was at once promised for the purpose. A window, according to a design generally approved, was ordered from Messrs. Morris & Co., London, and is now placed in the church. It is a five-light window. In the centre light, at the top, is represented Christ in Majesty, surrounded by angels. The rest of the window is filled up by four rows of figures. The highest contains the patriarchs Adam, Noah, and Abraham,—with Eve; the next, kings,—David in the centre, with Edward the Confessor and St. Louis, as historical kings, on either side, and Melchisedek and Judas Maccabeus at the two extremities. In the third row are Apostles and Prophets,—St. Peter in the centre, St. James and St. Stephen on either side, Elijah and John the Baptist at the two extremities. The last row represents female saints,—St. Rhadegund in the centre, as queen and abbess, patroness of Jesus

College; with four martyrs,—St. Barbara, St. Agnes, St. Dorothy, and St. Catherine. The figures are on a ground of grisaille, where flowered quarries alternate with bands on which the names are written. The cost of the window, with certain attendant expenses, was about 360*l.*

Episcopal Church, North Berwick.—A stained-glass window has been erected here by Colonel Denny, in memory of the officers, non-commissioned officers, and soldiers of the 71st Royal Highland Light Infantry who died in their country's service in Canada, the West Indies, the Crimea, and India, and who served with him from 1842 to 1857. The subject is Christ raising the widow's son, "Young Man, arise." The colours and badge of the regiment are introduced in the base panels. Messrs. Ballantine & Son, Edinburgh, were the artists.

Old West Church, Greenock.—Two additional memorial windows have been placed in this church. One in memory of John Hunter, ship-master. The subject illustrated is Christ walking on the sea, "It is I, be not afraid." The other window is in memory of Mrs. Denniston, erected by her son. Subject, the Presentation in the Temple. The artists were Messrs. Ballantine & Son.

St. Mary's, Diss.—This church possesses some good specimens of stained glass, and the south side has been recently beautified by the addition of two memorial windows, by Mr. Hughes, of London. One is in memory of members of the rector's family, — Thomas Manning, Edward Bosworth Manning, Susan, wife of John Shearman, and Frances and Anne Manning, and represents "Joseph's Dream," "The Cup found in Benjamin's Sack," and "The meeting of Jacob and Joseph." The other is in memory of the late Samuel and Harriet Farrow, and contains "The Good Samaritan," "The Parable of the Talents," and "The Wise and Foolish Virgins."

Powick Church.—The chancel of this church has just been further adorned by the erection of another stained-glass window. In this case the donor is Mrs. Moore, in memory of her deceased husband, the late Mr. W. Moore, of Elm Bank. The window was designed and executed by Mr. George Rogers. The subjects selected are the Bearing of the Cross and the Resurrection of our Saviour, in panels. Beneath are the symbols of the Pelican and the Cross, with the sacred monogram I.N.R.I. The quatrefoil at the top contains the Dove; a rich groundwork of the vine upon a ruby forms the background, and is surrounded with borderings of roses and foliage.

PROVINCIAL NEWS.

Ware.—The foundation-stone of the proposed corn exchange, at Ware, has been laid.

Ashbourn.—The manufactory which Messrs. M. Bond & Co. are erecting at Hanging Bridge, about a mile and a half from Ashbourn, has been completed, so far as putting on the roof. The building stands on the site of the New Mills, destroyed by fire a few years ago. The new building is three stories high, the material being pressed bricks, with alternate string courses of blue brick and freestone, and brick pilasters. The dimensions inside are:—Length, 137½ ft.; width, 54 ft.; height of rooms, 12½ ft. There are about 170 windows, the majority of which are 7 ft. 6 in. high by 4 ft. wide. The top room has 45 such windows, besides 14 skylights. The staircase is built of Macclesfield stone. In the turrets are two iron tanks, supplied by Messrs. Wright, Brothers, of Goscote Ironworks, Walsall, capable of containing 4,400 gallons of water, to be available, besides their use in the daily operations carried on, in case of fire. The building is surmounted by two angle turrets, with ornamental finials, and a clock-tower with two faces; and at one end of the main building is a counting-house, with ornamental ridge and finials. Besides the main building described, there are in course of erection—gas-house, boiler-house, and drying-room, stabling, coach-house, &c., and a dining-room for the hands. Attention has been bestowed on the ventilation of each division and room of the new mill. The building was designed by Mr. Sugden, architect, Leek; and the execution of the work by Mr. John Mathews, builder, also of Leek, who died somewhat suddenly on the 23rd ult.

Liverpool.—At a special meeting of the Mersey Docks and Harbour Board, a long discussion took place recently in reference to the new Bill which will be presented to Parliament during the forthcoming session. The proceedings included a motion to the effect that the sum of 258,000*l.*, intended for the completion of the docks at the north end of the town, be excluded from the Bill, which embraces additional borrowing powers. After a long debate the proposition relating to the exclusion of the 258,000*l.* was rejected by a majority of seven, and the Bill as originally drawn out, which carries its borrowing powers to the extent of 1,100,000*l.* was adopted. This Bill will enable the Dock Board to complete the new docks, basins, and carriers' sheds now in course of erection at the Bootle end of the dock estate.——The present Southern Hospital at Liverpool being too small for the demand upon it, a movement was commenced for erecting a new building on another site. A sum of 40,000*l.* is required, and at a meeting held at the townhall, subscriptions to the extent of 24,000*l.* have been announced. ——The New Exchange Company have entered into a contract with Messrs. Parker & Son, for the stonework of the two remaining wings of the new exchange buildings. The amount of the contract is 72,450*l.*

PATENTS CONNECTED WITH BUILDING.

MACHINE FOR PRESSING BRICKS. — *H. A. Dufrene.* A communication. Dated January 13, 1866.—This invention consists in an improved construction of pressing machine for the manufacture of bricks and other like articles made of brick earth or clay, by which more uniformity is obtained in the thickness of the articles than by the ordinary apparatus. This press is constructed of two parts, an upper and a lower part, acting on the middle of a frame of the form and dimensions suited to those of the articles to be pressed. The press receives a continuous motion from an eccentric worked by steam or hand power, and which, in its rotation, is made to move apart and bring together the said two parts of the press, between which the brick earth is placed and is compressed. The upper part is fixed to two rods, united by a striker or buffer fixed by four rods to a sliding-piece or block united to the collar of the eccentric, which sets it in motion. The lower part is free, and is raised by the striker or buffer during its ascent, and falls back of itself during the descent of the striker or buffer. The quantity of clay or brick earth exceeding that required is thrown back by the press itself by means of a hole, which may vary in its dimensions, made in one of the sides of the part of the press on which the pressure is exerted.

MACHINERY FOR MAKING BRICKS, TILES, &C.—*C. G. Johnson.* Dated January 13th, 1866.—This invention relates to that class of machinery for making bricks, tiles, and similar articles, in which a stream of clay is expressed from a pug-mill through a moulding die or dies, and is afterwards cut into lengths. In constructing machinery of this description according to this invention, the patentee places the knives or blades of the pug-mill on the same axis as that which carries the screw that is employed for forcing forward the stream of clay through the moulding die or dies. The portion of the outer casing of the pug-mill in which the screw works is by preference made of smaller diameter than the part of the casing in which the blades or knives of the pug-mill work. The exit end of this contracted portion of the casing of the mill is enlarged into a bell or enlarged mouth, and the end of this bell or enlarged mouth is closed by a fixed plate, which carries a bearing to receive the end of the shaft of the pug-mill. On one side of the bearings of this shaft is placed the moulding-orifice or die through which the clay is to be expressed. By forming the exit end of the pug-mill in this manner, the stream of clay is not diverted by the bearing of the pug-mill shaft as it is when the moulding-orifice is placed opposite to the centre of the shaft, as is now the case. Above the top of the mill, where the clay is arranged into the machine, the patentee places a pair of rollers, between which the clay has to pass before entering the pug-mill; these rollers crush any stones there may be in the clay. The rollers are driven from a wheel on the pug-mill shaft.

IMPROVEMENTS APPLICABLE TO WATER-CLOSETS AND COMMODE-PANS. — *H. E. Newton.* A communication. Dated 15th January, 1866. — The inventor of the present improvements looks upon the closing of the direct orifices of the pans as a secondary consideration, and effects the intended object by surrounding the seat or portion occupied by the person when sitting down with a continuous hermetic joint at the upper part of its circumference, thus enclosing the pan (and the parts contiguous thereto) in the limits within which the matters, whether solid or liquid, can be projected. By this means, not only are the fœcal matters arrested, but also any others which might adhere to the interior of the space above mentioned. In order to do away as much as possible with any obstacle which might stop the descent of the solid matters, the sides of the pan are made vertical instead of inclined as usual. With regard to the urine, it is arrested by the front projections set in such a manner that it prevents splashing, and forces the liquid to flow down inclines into the receptacle below.

Books Received.

The Theory of Strains in Girders and similar structures, with Observations on the Application of Theory to Practice, and Tables of the Strength and other Properties of Materials. By BINDON B. STONEY, B.A., Memb. Inst. Civ. Eng. &c. &c. London: Longmans, Green, & Co. 1866.

To every earnest student in the engineering profession Mr. Bindon Stoney's book on the theory of strains will be a welcome friend. One of the principal reasons why many English engineering students never pass beyond the grade of moderately good draughtsmen is, the difficulty of acquiring from books a proper understanding of the subject of their profession.

This is not the case with engineering students abroad. In the Polytechnical schools of Germany, the pupils are well grounded in the theory of engineering, and come over to England and beat the young English student on his own ground.

Most of the English authors of authority on engineering write in too high a style for the comprehension of young beginners; and as, in an engineering office, an individual instruction to all the pupils is altogether out of the question, a pupil, except in instances of rare perseverance and ability, after having duly served his period of apprenticeship, finds himself a draughtsman and not an engineer.

There are no gradations by which he may rise. He must encounter at the first step such an array of formulæ and equations that he cannot successfully cope with them alone, and so is obliged to settle down to the drudgery of the profession.

The results following from this state of things are becoming serious enough to invite special attention. It is questionable, indeed, whether the prodigious arithmetic sometimes brought into force be necessary at all to the elucidation of numerous matters to which, by the force of habit, it is applied; and as has been lately noticed by some writers, the entire science of modern geometry is becoming so overlaid with symbols and figures that the subject of inquiry is often buried beneath them.

The portion of Mr. Stoney's work treating of transverse strain and deflection, is, we fear, still not what is required for learners; but nothing could be more admirable than the chapters on bracing, and various other portions of the book. Perhaps Bow's treatise on bracing does not include so many examples, and so ample a definition of the various kinds of bracing in use, as we find given in the first volume of Mr. Stoney's theory of strains.

The style in which the book is put together must also be commended, affording simple and unusual facilities for reference, which in no way interfere with its being read through continuously.

VARIORUM.

THE *Art-Journal* gives some particulars of the Albert Memorial in Hyde Park, especially of the metal work. Wrought-iron is employed for the whole of the framework, and cast-iron for the structural parts that are to be built upon this framework. All the more distinguished visible portions of the work, the bases and capitals of columns, the cornices, crestings, finials, and other similar details, and with them the cross that is to crown the entire edifice, are to be of a fine bronze. Mr. Skidmore has covered with lead the whole of the ironwork that otherwise

would be visible, and consequently would be exposed to atmospheric action. "Lead and bronze are the only visible, and therefore the only assailable, metals. This same lead-work is wrought into an elaborate series of exquisite surface-designs, of which the leading motive is to form *settings* for innumerable pieces of polished agate, onyx, jasper, cornelian, crystal, marble, granite, and other richly-coloured hard substances, together with inlays of enamels of various hues. The cross that forms the finial of the memorial is a work of great dignity, executed in bronze, with inlays of stones and rich gilding. It is a Latin cross, severe in outline, and yet at its head and other extremities, and also at the intersection of its limbs, a strict simplicity of form is not maintained. It stands upon a highly enriched globe, which, in its turn, rests upon the foliated capital of a single cylindrical shaft, wreathed towards its head with spiral enrichment: and, lower down, wrought to an octagonal section, having four of its faces studded with gem-work, while a statue is placed in front of each of its other four faces. Sixteen bronze statues, of various heights, the four principal ones being 8 ft. high, are grouped about the several stages of the spire, and add greatly to the dignified beauty of the whole composition."——Hardwicke's "Science Gossip" goes on, and improves as it goes. It has evidently found a public.——A paper "On Water-Filters" by Dr. Divers, in the *Popular Science Review*, deserves attention.——*The British Workman* and *Band of Hope Review* (the yearly part of each is just out) are specially noticeable for the excellent woodcuts, of large size, with which they are filled. One of these, in the *British Workman*, is drawn from the notice against swearing affixed by Sir Christopher Wren to the walls of the Cathedral. A capital sheet almanac, for a penny, is issued with each of these serials.——The "Financial Reform Almanac," at the same price, exhibits at a glance a large amount of financial information.——The January *Fraser* is a very entertaining number. It includes Lord Stanhope's lecture "On the Influence of Arabic Philosophy in Mediæval Europe." "Among South-Western Cathedrals" is too slight to satisfy architects. ——*The Gardener* (W. Blackwood & Sons) promises to be an agreeable and useful cheap monthly. The editor wants specially to make it useful, he says, to that large and increasing class of the community who, previously to the development of the railway system, lived in cities, but who now live in the country.

Miscellanea.

THE LOCAL GOVERNMENT OF THE METROPOLIS.—The Right Hon. S. H. Walpole, the Secretary of State for the Home Department, has appointed Tuesday next, the 8th inst., at two o'clock, to receive the deputation agreed to at the recent public meeting at St. James's Hall, called by the Metropolitan Municipal Association for Promoting the Better Local Government of the Metropolis.

ATLANTIC CABLE DIVIDEND.—The Anglo-American Telegraph Company have announced that the net profits of the company have exceeded the rate of 25 per cent per annum from the date of opening the cable for public traffic on the 28th of July last, it has been resolved to distribute to the shareholders, early in February, a dividend, on account, equal to 10 per cent. on their shares, leaving the remaining 15 per cent. to be disposed of at the annual meeting to be held in July or August next.

SUPPLY OF GAS TO THE METROPOLIS.—At a meeting of the Strand District Board of Works, held on the 19th ult., resolutions were passed condemnatory of the monopoly afforded to the gas companies as highly injurious to the consumers, and directing a petition to the Board of Trade that steps may be taken during the next session of Parliament to repeal the present Gas Acts, and provide for a good supply of pure gas for the public. The subject was very fully discussed, and the resolutions passed unanimously; the general feeling throughout the discussion appeared to be that the improvement of the *quality* of the gas was of paramount importance, and that this would only be accomplished by the Metropolitan Board or some other municipal authorities having the whole management of the gas vested in them, as is the case in many of the municipal towns in the provinces.

DRAINAGE OF HORNCASTLE.—The recently-formed Local Board of Horncastle have resolved to proceed, at once, with drainage works for the town, and have instructed Mr. Lawson to prepare the necessary plans.

NEW UNIVERSITY COLLEGE, GLASGOW.—By direction of the Building Committee of the New University College, of which Mr. G. G. Scott, R.A., is the architect, plans were submitted by several engineers for the ventilation and warming of the building. Ultimately those of Mr. W. W. Phipson, C.E., London, were accepted. The cost of the building will be about 200,000*l*. Mr. Thompson, of Peterborough, is the contractor.

WORKMEN'S LODGINGS IN SPAIN.—A Madrid letter in the *Courrier de Bayonne* has the following:—"The question of workmen's lodging-houses has been discussed during the last few days by the *Epoca* of this city, and by the *Provincias*, a journal of Valencia. The inquiry into subjects intended to insure or increase the comfort of the necessitous classes seems to me more important than any others, and for that reason I insist more particularly on them. The Society of Friends of the country of Valencia has, on its side, been examining the most economical means of procuring lodgings for the poor."

IMPROVED VENTILATION OF MINES.—A plan for the ventilation of coal mines has been invented and patented by Mr. Joseph Lang, overlooker at Mr. Outram's Castle-street Mill, Moor-lane, Preston. The ingress of fresh air by the descending shaft, and the expulsion of foul air by that ascending, are secured by mechanical agency. At the mouth of the ascending shaft a fan is connected with the cupola. Upon the fan being set in motion, ascending pipes act as "suckers," and remove the gases received below in junction boxes. As the bad air is thus expelled, fresh air enters the pit by the descending shaft, and thus a continuous current of fresh air is secured, proportionate to the foul air expelled, while the former forces the latter to the junction boxes, giving it no opportunity for accumulating in the several workings. The quantity of air to be admitted and expelled can be simultaneously regulated at the will of the operator; so that a hurricane of wind might be improvised, on the one hand, while on the other a gentle breeze can be had with equal facility.

SMOKE CONSUMPTION.—A new appliance for the consumption of smoke has been in operation at the works of Messrs. J. Wade & Sons and Messrs. Rouse & Co., of Bradford. The design has been for some time patented by Mr. Charles Gall, an engine tenter, of Bridgenorth, Shropshire, and has, it is said, been already applied with success at various establishments in Bridgenorth, Wolverhampton, and Blackburn. The bridge is fitted with an air-valve below the level of the fire-bars, the valve being slung in the same manner as an ordinary throttle-valve. A short distance behind the main bridge is formed another of considerable height, this second bridge being fitted with a "striking plate," which deflects upwards, the air entering the air-valve. When the air-valve is opened, the air entering through it is directed upwards, and mixed with the heated gases escaping from the fire, thus supplying the oxygen necessary for their complete combustion. The simple self-regulating arrangement which forms the principal feature of the plan, is to admit the quantity of air required according to the state of the fire. This consists of a pair of vessels capable of containing water, the pair being connected by a bar which turns in a centre fixed to the boiler. The bottoms of the vessels are also connected by a small pipe furnished with a stop-cock, and another pipe of large diameter leads from the bottom of one vessel to the top of the other. The bar connecting the two vessels is furnished with a couple of tappets, these being acted upon by the pin of a small crank fixed at the upper end of the hinge-pin of the fire-door, this pin being prolonged upwards for the purpose of carrying it. To the underside of the one vessel there is attached a link, the lower end of which is coupled to a lever fixed in a slight shaft which extends along the ashpit to the bridge, this shaft carrying near its inner end another bent lever. This bent lever acts upon another lever, which is connected to the upper part of the air-valve by a short link and staple, and thus by depressing the lever the air-valve will be closed, the manner in which the valve is hung tending to make it fall open.

SANITARY RESPONSIBILITY OF CORPORATIONS. Mr. Brumback, of Louisville (U.S.), who lost his wife and daughter by cholera, has sued his city corporation for damages in the sum of 25,000 dollars, alleging that if the streets in his vicinity had been properly graded, no deaths would have occurred.

THE LIGHTING OF DURHAM CATHEDRAL.—The system of gas-lighting adopted some time since in the cathedral having recently been found in an unsatisfactory state, the dean and chapter have lighted a portion of the nave in the manner adopted in the choir of York Minster and round the dome of St. Paul's. The mode of lighting is by pipes laid on the string-course immediately over the nave arches, each pipe having about ninety small jets projecting from it, and giving the effect of rows of brilliant beads of light. These pipes are supplied by large mains carried along in the triforium, and have each separate taps, so that the different portions can be lighted either singly or all together. The general wish seems to be in favour of its extension to the choir. The work has been carried out by Mr. G. Newby, under the direction of Mr. C. Hodgson Fowler, architect.

THAXTED NEW GAS WORKS.—These works are now complete. The contractors for the buildings were Messrs. Cole, Brothers, of Thaxted. The retort-house, coal-shed, and other erections are of white brick with red piers. These are in the low part of the town. The chimney-shaft is tubular, and about 40 ft. high. The roofs are covered with Taylor's patent red tiles. There are two double pipe condensers in front outside, and three retorts, two of which will be worked in summer and all in winter; two purifiers with patent centre valve, and the gas-holder is self-acting, 31 ft. in diameter, 8 ft. deep, and calculated to hold 12,000 ft. of gas, with five extra strong columns. The grounds are inclosed with white brick walls and red brick copings. Many private lights have already been burnt; and it is expected that 180 will be commenced with, at 6s. 8d. per 1,000 cubic feet. The public lamps are twenty-four, provided for by a district rate on the inhabitants of the town at 6d. in the pound.

MISS HOSMER'S MONUMENT TO ABRAHAM LINCOLN.—A model of "The Freedmen's Monument to Abraham Lincoln" has been set up for exhibition in the Art Gallery of the Boston Athenæum. It recently arrived from Italy, and is the last work and the masterpiece of Miss Harriet Hosmer. It will be 60 ft. in height, and the base 60 ft. square. The architectural work will be of New England granite; the figures, the ornaments, and the bas-reliefs of bronze. It will cost a quarter of a million of dollars. The idea originated with a negro woman, who volunteered a 5-dollar bill to begin with, at the time of the president's assassination. The freed people have already contributed 23,000 dollars. The salient features of the monument comprise a temple, with thirty-six female figures, hand-in-hand round the base, representing the states; the emancipation of the slave, represented by four bas-reliefs; and the preservation of the Union, by representations of four events of the war, one of these being the assassination. The temple contains a statue of Abraham Lincoln, on a sarcophagus, with four Victories mourning his death.

THE STREETS OF ROME.—The correspondent of the *Telegraph* writes,—"The filthiest streets of Rome are in the Borgo, and the Borgo is composed of the streets immediately surrounding St. Peter's. "*Tu es Petrus*," runs the great inscription in mosaic round the drum of the dome, in letters every one of them as tall as a Life-guardsman,—"*Tu es Petrus, et super hanc petram ædificabo ecclesiam meam;*" but underneath the rock of the Church priestcraft has built up a dunghill. One loses patience altogether with the splendour of the Roman churches when we contrast that splendour with the squalor by which it is environed. At least, among us heretics, consigned by the Romanists to eternal torment, the church goes hand-in-hand with the trim school-house, full of clean and rosy children, with the hospital, the asylum, and the reformatory. But here there is but one step from Raffaelle's pictures and Bernini's statues to Beggar's Bush and the Cadger's Arms. Bramante and Fontana's great façades only screen the nest of hovels behind; and all the loathsome losels of the Roman Alsatia wash their rags in fountains adorned with saints and angels."

SURVEYOR OF POLICE BUILDINGS.—The surveyorship of police buildings in the metropolitan district, and of county courts, held by the late Mr. Reeves, has been given to Mr. T. C. Sorby, architect.

DUNDALK.—A Louth correspondent of the *Freeman's Journal* states that the engine-drivers employed on the Belfast Junction Railway have given notice of their intention to resign their places in consequence of the frequency of attempts to upset trains on that line.

THE STATUE OF THE QUEEN FOR LIVERPOOL.—Mr. Thornycroft, with the assent of the Queen, has been selected as the sculptor for the equestrian statue of her Majesty to be erected opposite St. George's Hall, Liverpool, in a line with that of the Prince Consort. The statue is to cost 5,000*l.*

THE STREET GAS EXPLOSION, NEAR LEATHER-LANE.—The coroner's inquest on the three persons killed by this accident has not yet been concluded. From the evidence already led it appears that the men employed in the street by the Chartered Gas Company left work on the Saturday of the accident without sufficiently securing the gas in the main, where they were at work; and some hours afterwards, the explosion took place, knocking down two houses, and killing three persons, at Nos. 4 and 5, Summer-court, Eyre-street-hill, between Little Bath-street and Back-hill.

ARCHÆOLOGICAL INVESTIGATION IN WESTMORLAND.—Investigations have lately been made in five sepulchral tumuli, situated in the mountainous country about Appleby, Brough, and Kirkby Stephen. The excavations have yielded remains of ancient Britons, both burnt and unburnt, and in two cases showed the practice of Anglo-Saxon adoption of older barrows for burials in a barrow slightly to the south of Kirkby Stephen, a British burial having there been disturbed by Anglo-Saxons to insert the rough log coffin and body of an Anglo-Saxon, as shown by the funeral accompaniments.

RE-OPENING OF SPITALFIELDS CHURCH.—This church has been re-opened for Divine worship, after having been kept closed for a period of six months, during which it has undergone extensive renovations. It was originally built by Hawksmore. The windows have been enlarged, the columns have been freed from the encumbrances by which they were defaced, and the ceiling has been thoroughly cleansed, and its decorations have been brought into relief. The architect under whose superintendence these changes have been effected is Mr. Christian. The total cost of the renovation is estimated at 6,680*l.*

ARCHITECTURAL PRIZES, PARIS.—At the recent public meeting of the French Academy of Fine Arts, the Deschaumes prize of 1,500 francs, founded to aid young architects without fortune, who have relatives dependent on them, was divided between M. Marcel Boisvert and M. Méquer. The latter artist was, at the age of twenty-six, a workman in a factory, when his arm was broken by machinery; the limb was incompletely cured, and he was compelled to seek a new occupation. He studied architecture, while getting his living by writing, and afterwards obtained employment as conductor in the department of the Ponts-et-Chaussées, and supported his mother and sister. The *prix Leclère* was awarded to M. Dutert, architect, for a design for a monument commemorative of the visit of the Emperor to Algeria. The subject proposed for the same prize next year is "a monumental bridge, situated in the midst of a great city, at the point of an island, magnificently decorated, and presenting an edifice consecrated as a souvenir of a universal exhibition of industry." These terms accord exactly with the position of the Pont Neuf, which touches the point of the island of the old city of Paris, where stands the equestrian statue of Henri IV., and the rebuilding of this bridge, and of the quaint old triangular Place Dauphine, once a court quarter of the town, has long been under consideration. The subject for the Bordin prize for 1868 is the analogies and differences which appear between Greek and Roman architecture; the authors being instructed to point out, either on the evidence of facts, or by deduction, what artists and artisans contributed to the construction and decoration of the public and private edifices either of Greece or Italy, and what was the civil and social condition of such artists and artizans.

RE-OPENING OF THE ROYAL CHAPEL AT WINDSOR. — The Royal Chapel near Cumberland Lodge, in Windsor Great Park, has been re-opened for divine service. The new edifice, the chancel of which was consecrated some time back, has been erected in the Early English style of architecture by the Commissioners of Woods and Forests, from designs by Mr. Salvin and Mr. Teulon, the works having been superintended by Mr. Morris. The plan includes a nave, an aisle, chancel, and transept, while the open-pointed oak roof is carried partly by the north wall and some carved stone pillars separating the nave from the south aisle. In the chancel is a memorial window to the memory of the late Duchess of Kent. Separated from the chancel by an oaken hand-rail, and on its south side, is the royal closet, which has a stone screen dividing it from the end of the aisle.

POWER OF BURIAL BOARDS OVER INSCRIPTIONS. In the case of the Dean of Carlisle and the Carlisle Burial Board as to the right of Burial Boards to interfere with monumental inscriptions, Chancellor Burton, in the Consistory Court of the Diocese of Carlisle, has given judgment. After reviewing the Acts of Parliament relating to the subject, the Chancellor said the law directed the ground to be consecrated; and it was to be noted that every deed of consecration of burial grounds, whether under the anciently accustomed regulations, or the principle of cemeteries, saved all episcopal rights and jurisdiction. That was an invariable condition. The 33rd section of the 15th and 16th of Victoria gave Burial Boards the right of "erecting or placing any monument, gravestone, tablet, or monumental inscription" in their ground, but he considered that the Act only had the incumbent in its eye; the bishop's authority may still permit the inscription or may still refuse it, or may order its removal. He held, therefore, that while the Board may object to any particular inscription, as ministers and churchwardens have heretofore objected; on the other hand, any person hindered by the Board may appeal to the Court.

THE MANAGEMENT OF FENCES.—The subjoined is an extract from a paper read by Mr. H. W. Keary, at the quarterly meeting of the Wenlock Farmers' Club:—"Although I deprecate most strongly an unnecessary number of fences, I am convinced that true economy points to the maintenance of good, strong fences, and such as will really answer the purpose for which fences are made. And this will not be found to be a work of any difficulty, if only a little attention and method are shown in their management. If possible, only one, or, at most, two men should be employed to cut the hedges on a farm, and great care should be taken to furnish them with proper tools. A few lessons, and a little firmness at first, will be quite enough to teach a handy labourer how to do his work, and I believe that the very fact of his having a particular branch of labour entrusted to him operates as a stimulus to do the work well. On very light sand I have sometimes observed old trimmed fences become a little cankered on their lower stems. This, however, has been entirely remedied, and at a small cost, by throwing up the soil to the roots on each side; and, indeed, it is not a bad plan to treat one or two fences in this way every year. The soil is naturally washed away after a lapse of time, and I know nothing that renovates a weakly fence more. The system of pleaching fences is so generally adopted in this district that it appears necessary to say a few words respecting it. The skill of the workman is quite as important in this branch of hedge-cutting as is the one I have just considered. Great care should be taken to cut down all the large and thick pieces, and to lay or pleach only those that are likely to live under the operation. The pleachers should not be too long, and plenty of stakes should be used. On pastures I think it desirable to use binders on the top, otherwise the cattle are apt to disturb the pleachers with their horns, and materially injure the fence in its early growth after cutting. At the time of pleaching, the ditch, if any, should be well cleared out, and all weeds well cleaned away from the roots of the thorns; fresh soil should then be thrown up and worked well into the face of the bank; the bank should also be reduced to its proper size, and left with a sufficient slope. Many old banks are much too large, and may be reduced with great advantage; but care and judgment are required even here, for if a bank is cut down too steep and too close, the roots of the fence are exposed, and will gradually die away."

SOUTH KENSINGTON MUSEUM.—The number of visitors during the Christmas week was 24,108.

THE RESTORATION OF GLOUCESTER CATHEDRAL. The youthful Earl of Eldon, who owns considerable property on the Cotswolds, and whose coming of age was celebrated a few weeks ago, has forwarded to the Dean of Gloucester 500*l.*, to be applied to the restoration of the cathedral.

BUST OF THE LATE LORD MACAULAY.—A bust of Lord Macaulay has, with the permission of the Dean and Chapter, been placed in Westminster Abbey by his sister, Lady Trevelyan. It stands upon a bracket, designed by Mr. Scott, and is placed in the immediate neighbourhood of the grave and of Addison's statue, in Poet's Corner.

CARPENTERS' APPRENTICES. — In a case just tried it has been decided that a master is not justifiable in employing an apprentice in domestic or other uses unconnected with the business he is learning,—such as in beating carpets, or even in stacking boards. The judge gave a verdict against the master, with 15*l.* damages, the claim, however, being 50*l.*

COST OF LAND, LONDON.—Mr. Mechi writes: "The great city of London is comprised in an area of only 632 acres and a few poles; in fact, the size of a farm which in the country could be had for a rent of 600*l.* to 1,000*l.* per annum. My country friends will be astonished when I tell them that the last cheap thing I heard of as purchased land in Lombard-street was over two millions sterling per acre, or nearly 70*l.* per square foot of area."

GLASS TRADE, AMERICA. — The making of window and bottle glass at Pittsburg (U.S.) gives employment to 1,800 men and boys, whose annual wages amount to 1,396,516 dols. The amount of silica consumed is 242,000 tons, and it is chiefly brought from Missouri. The annual value of the manufactured glass is estimated at 2,160,000 dols. These reports are of the window and bottle glass work alone, and do not include the nineteen flint-glass factories, which are valued at 1,298,100 dols., pay weekly wages amounting to 19,000 dols., and annually consume 2,095,806 bushels of coal, employ 2,304 hands, and make 2,000,000 dols. worth of glassware.

PROPOSED INFIRMARY FOR WIGAN COLLIERY DISTRICT.—It has been resolved at an influential meeting of the inhabitants of Wigan and its neighbourhood that an effort be made to raise 30,000*l.* for the erection of a suitable building, and as a part of the endowment fund, for an infirmary, which should contain some fifty or sixty beds, and the working expenses of which would be about 3,000*l.* annually. A committee has been appointed, and a donation list opened. The employers of labour are advised to confer with the operatives in order to secure a donation of 1d. per week from each person. The subscriptions promised in the room amounted to 14,500*l.*

MEMORIAL OF THE LATE ARCHDEACON COXE.—The memorial of the late Venerable R. C. Coxe, Archdeacon of Lindisfarne and Vicar of Eglingham, has taken the shape of a porch to Eglingham Church, according to plans approved by the late archdeacon, and which were found in his library. The committee are about to record the dedication of the porch to the memory of Archdeacon Coxe by placing a brass plate therein with the following inscription:—"Unto the memory of Richard Charles Coxe, M.A., Archdeacon of Lindisfarne, Canon of Durham, and during 12 years Vicar of Eglingham, this Porch was erected by his Neighbours and Friends; whereby was followed out a plan which had been designed under his own eye to provide a worthier vestibule to the Church. He died, venerated by the clergy and beloved by his people, August 25th, 1865, in the 66th year of his age." Mr. F. R. Wilson was the architect. The total cost has been 104*l.* 18*s.* 8*d.*

TENDERS

For a row of four labourers' cottages at Hadlow, for Mr. Wm. Crundwell. Mr. Henry Stapley, architect:—

Hammond	£508 10 0

For a detached villa residence, to be built in the Ridgeway-road, Enfield, for Mr. H. W. Draper. Mr. T. J. Hill, architect. Quantities supplied by Mr. R. L. Curtis:—

Moreland & Burton	£2,159 0 0
Field & Sons	2,100 0 0
Fairhead	1,876 0 0
Cushing	1,875 0 0
Anley	1,850 0 0
Patman, Brothers	1,849 0 0
Webb & Sons	1,757 0 0